

Implications of Erythropoietin in the Prevention and Treatment of Preeclampsia in HIV-Positive Pregnant Women

*Emmanuel Ifeanyi Obeagu¹ and Getrude Uzoma Obeagu³

¹Department of Medical Laboratory Science, Kampala International University, Ishaka, Uganda.

²School of Nursing Science, Kampala International University, Ishaka, Uganda.

*Corresponding authour: Emmanuel Ifeanyi Obeagu, Department of Medical Laboratory Science, Kampala International University, Uganda.

E-mail: emmanuelobeagu@yahoo.com, obeagu.emmanuel@kiu.ac.ug, 0000-0002-4538-0161

Abstract

Preeclampsia remains a significant complication of pregnancy, particularly in HIV-positive women, posing substantial risks to both maternal and fetal health. Erythropoietin (EPO), traditionally recognized for its role in erythropoiesis, has emerged as a promising therapeutic agent with potential implications in the prevention and treatment of preeclampsia. This review aims to explore the current understanding of the role of EPO in preeclampsia management, with a specific focus on its application in HIV-positive pregnant women. We examine the underlying pathophysiology of preeclampsia, discuss the potential mechanisms of action of EPO in mitigating its effects, and summarize the existing evidence regarding the use of EPO in this context. Additionally, we address the challenges and future directions for research in this field, emphasizing the need for further clinical trials to elucidate the safety and efficacy of EPO in HIV-positive pregnant women with preeclampsia.

Keywords: *Erythropoietin, Preeclampsia, HIV, Pregnancy, Treatment, Prevention*

Introduction

Preeclampsia remains a significant complication of pregnancy, characterized by hypertension and proteinuria after 20 weeks of gestation. This condition poses substantial risks to both maternal and fetal health, including maternal organ dysfunction, preterm birth, and fetal growth restriction. Despite advances in obstetric care, preeclampsia continues to contribute to maternal and perinatal morbidity and mortality globally. HIV-positive pregnant women face an even greater challenge, as HIV infection may exacerbate the underlying pathophysiological processes leading to

Citation: Obeagu EI, Obeagu GU. Implications of Erythropoietin in the Prevention and Treatment of Preeclampsia in HIV-Positive Pregnant Women. Elite Journal of HIV, 2024; 2(3): 1-13

preeclampsia, further complicating management strategies. The pathophysiology of preeclampsia is complex and multifactorial, involving endothelial dysfunction, placental abnormalities, immune dysregulation, and maternal predisposing factors. Placental ischemia/hypoxia and the release of soluble factors trigger systemic endothelial dysfunction, leading to the clinical manifestations of hypertension, proteinuria, and end-organ damage. In HIV-positive pregnant women, the immunological alterations associated with HIV infection may contribute to an increased susceptibility to preeclampsia, highlighting the need for tailored approaches to management in this population.¹⁻³²

Erythropoietin (EPO), traditionally recognized for its role in stimulating erythropoiesis, has emerged as a potential therapeutic agent in the prevention and treatment of preeclampsia. Beyond its hematopoietic effects, EPO possesses pleiotropic properties, including anti-inflammatory, anti-apoptotic, and angiogenic activities. These properties make EPO an attractive candidate for intervention in preeclampsia, where vascular dysfunction, placental insufficiency, and immune dysregulation play key roles in pathogenesis. Despite the potential benefits of EPO in preeclampsia management, several challenges must be addressed, including concerns regarding safety, optimal dosing regimens, and the need for personalized approaches considering individual patient characteristics. Moreover, the unique immunological and vascular challenges posed by HIV infection necessitate careful consideration when extrapolating findings from studies conducted in HIV-negative populations. Therefore, there is a critical need for further research to elucidate the role of EPO in preeclampsia pathogenesis and evaluate its therapeutic potential, with a specific focus on HIV-positive pregnant women. Such efforts hold the promise of improving maternal and fetal outcomes and reducing the burden of preeclampsia in this vulnerable population.³³⁻⁶⁴

Pathophysiology of Preeclampsia

Preeclampsia is a complex and multifaceted disorder that poses significant risks to maternal and fetal health during pregnancy. While the exact etiology remains elusive, current understanding suggests that preeclampsia arises from a cascade of pathological processes involving maternal, placental, and vascular factors. Central to its pathophysiology is the aberrant development of the placenta, characterized by inadequate trophoblast invasion and impaired spiral artery remodeling. This leads to placental ischemia/hypoxia and the release of soluble factors, such as antiangiogenic factors (e.g., soluble fms-like tyrosine kinase-1, sFlt-1) and proinflammatory cytokines, into the maternal circulation. These circulating factors provoke systemic endothelial dysfunction, resulting in the hallmark clinical manifestations of preeclampsia, including hypertension, proteinuria, and end-organ damage. Moreover, the maternal endothelium undergoes a state of activation and dysfunction, characterized by increased vascular permeability, vasoconstriction, and thrombosis. Endothelial dysfunction contributes to the pathogenesis of hypertension by impairing vasodilation and promoting vasoconstriction, exacerbating the hypertensive state observed in preeclampsia. Furthermore, the compromised endothelial barrier function leads to the leakage of proteins, such as albumin, into the urine, manifesting as proteinuria. Beyond the renal system, endothelial dysfunction contributes to end-organ damage, including hepatic dysfunction (e.g., HELLP

Citation: Obeagu EI, Obeagu GU. Implications of Erythropoietin in the Prevention and Treatment of Preeclampsia in HIV-Positive Pregnant Women. *Elite Journal of HIV*, 2024; 2(3): 1-13

syndrome), neurological complications (e.g., eclampsia), and cardiovascular disturbances (e.g., pulmonary edema, myocardial ischemia).⁶⁵⁻⁷⁹

In addition to placental and endothelial factors, immune dysregulation has emerged as a critical component in the pathophysiology of preeclampsia. The maternal immune system undergoes dynamic changes during pregnancy to accommodate the semi-allogeneic fetus. However, in preeclampsia, there is evidence of aberrant immune activation, characterized by an imbalance in pro- and anti-inflammatory responses. This dysregulated immune response contributes to the systemic inflammatory milieu observed in preeclampsia, further exacerbating endothelial dysfunction and promoting maternal vascular injury. Furthermore, maternal predisposing factors, such as obesity, pre-existing hypertension, diabetes mellitus, and autoimmune disorders, can amplify the risk of developing preeclampsia. These underlying comorbidities contribute to the systemic endothelial dysfunction and inflammation observed in preeclampsia, highlighting the complex interplay between maternal health status and the pathophysiology of the disorder. Overall, the pathophysiology of preeclampsia involves a multifactorial interplay between placental dysfunction, endothelial activation, immune dysregulation, and maternal predisposing factors, culminating in the clinical syndrome characterized by hypertension, proteinuria, and end-organ damage. A comprehensive understanding of these underlying mechanisms is crucial for the development of targeted therapeutic interventions aimed at preventing and managing preeclampsia effectively.⁸⁰⁻⁹²

Role of Erythropoietin in Preeclampsia

Erythropoietin (EPO), primarily known for its role in erythropoiesis, has garnered attention for its potential therapeutic effects beyond hematopoiesis, particularly in the context of preeclampsia. Emerging evidence suggests that EPO and its receptors are expressed in various non-hematopoietic tissues, including the placenta and endothelium, implicating its involvement in vascular homeostasis and tissue protection. In the pathophysiology of preeclampsia, EPO holds promise as a multifaceted therapeutic agent due to its pleiotropic effects, including anti-inflammatory, anti-apoptotic, and angiogenic properties. One of the hallmark features of preeclampsia is systemic endothelial dysfunction, characterized by impaired vasodilation, increased vascular permeability, and prothrombotic tendencies. EPO has been shown to exert vasoprotective effects by enhancing endothelial function, promoting nitric oxide (NO) production, and inhibiting endothelial cell apoptosis. By restoring endothelial integrity and function, EPO may mitigate the vascular injury associated with preeclampsia, thereby alleviating hypertension and reducing the risk of end-organ damage.⁹³⁻⁹⁸

Furthermore, EPO exhibits anti-inflammatory properties by modulating immune responses and suppressing the release of proinflammatory cytokines. In preeclampsia, the dysregulated immune activation contributes to the systemic inflammatory milieu, exacerbating endothelial dysfunction and promoting maternal vascular injury. By attenuating the inflammatory response, EPO may help mitigate the pathological processes underlying preeclampsia and reduce maternal morbidity. Angiogenesis plays a critical role in placental development and vascular remodeling during

Citation: Obeagu EI, Obeagu GU. Implications of Erythropoietin in the Prevention and Treatment of Preeclampsia in HIV-Positive Pregnant Women. *Elite Journal of HIV*, 2024; 2(3): 1-13

pregnancy. Dysregulated angiogenesis, characterized by impaired placental vascularization and aberrant spiral artery remodeling, is a hallmark feature of preeclampsia. EPO has been shown to stimulate angiogenesis through various mechanisms, including the upregulation of vascular endothelial growth factor (VEGF) expression and the promotion of endothelial progenitor cell recruitment and proliferation. By enhancing placental vascularization and improving uteroplacental blood flow, EPO may mitigate placental ischemia/hypoxia, thereby attenuating the pathological processes associated with preeclampsia. Moreover, EPO exhibits cytoprotective effects against oxidative stress and apoptosis, which are implicated in the pathogenesis of preeclampsia. Oxidative stress leads to the generation of reactive oxygen species (ROS), contributing to endothelial dysfunction, placental injury, and maternal vascular damage. EPO counteracts oxidative stress by scavenging ROS and enhancing antioxidant defense mechanisms, thereby preserving cellular viability and function. Additionally, EPO inhibits apoptosis in various cell types, including endothelial cells and trophoblasts, potentially reducing placental injury and improving pregnancy outcomes in preeclampsia.⁹⁹⁻

Conclusion

Erythropoietin holds promise as a novel therapeutic agent in the prevention and treatment of preeclampsia, particularly in HIV-positive pregnant women. By targeting multiple pathways implicated in the pathophysiology of preeclampsia, including endothelial dysfunction, placental abnormalities, and immune dysregulation, EPO may offer a multifaceted approach to mitigate the risks associated with this condition. However, further research is needed to establish its safety, efficacy, and optimal dosing strategies in this vulnerable population. Ultimately, a better understanding of the role of EPO in preeclampsia management has the potential to significantly improve maternal and fetal outcomes and reduce the global burden of this obstetric complication.

References

1. Al-Jameil N, Khan FA, Khan MF, Tabassum H. A brief overview of preeclampsia. *Journal of clinical medicine research*. 2014;6(1):1.
2. Lambert G, Brichant JF, Hartstein G, Bonhomme V, Dewandre PY. Preeclampsia: an update. *Acta Anaesthesiol Belg*. 2014;65(4):137-149.
3. Tanacan A, Fadiloglu E, Beksac MS. The importance of proteinuria in preeclampsia and its predictive role in maternal and neonatal outcomes. *Hypertension in pregnancy*. 2019;38(2):111-118.
4. Obeagu EI, Agreen FC. Anaemia among pregnant women: A review of African pregnant teenagers. *J Pub Health Nutri*. 2023; 6 (1). 2023;138. [links/63da799664fc860638054562/Anaemia-among-pregnant-women-A-review-of-African-pregnant-teenagers.pdf](https://doi.org/10.3390/63da799664fc860638054562/Anaemia-among-pregnant-women-A-review-of-African-pregnant-teenagers.pdf).
5. Obeagu EI, Ezimah AC, Obeagu GU. Erythropoietin in the anaemias of pregnancy: a review. *Int J Curr Res Chem Pharm Sci*. 2016;3(3):10-8. [links/5710fae108ae846f4ef05afb/ERYTHROPOIETIN-IN-THE-ANAEMIAS-OF-PREGNANCY-A-REVIEW.pdf](https://doi.org/10.3390/5710fae108ae846f4ef05afb/ERYTHROPOIETIN-IN-THE-ANAEMIAS-OF-PREGNANCY-A-REVIEW.pdf).

Citation: Obeagu EI, Obeagu GU. Implications of Erythropoietin in the Prevention and Treatment of Preeclampsia in HIV-Positive Pregnant Women. *Elite Journal of HIV*, 2024; 2(3): 1-13

6. Obeagu EI, Adepoju OJ, Okafor CJ, Obeagu GU, Ibekwe AM, Okpala PU, Agu CC. Assessment of Haematological Changes in Pregnant Women of Ido, Ondo State, Nigeria. J Res Med Dent Sci. 2021 Apr;9(4):145-8. [links/608a6728a6fdccaebdf52d94/Assessment-of-Haematological-Changes-in-Pregnant-Women-of-Ido-Ondo.pdf](https://epjournals.com/journals/EJHIV/links/608a6728a6fdccaebdf52d94/Assessment-of-Haematological-Changes-in-Pregnant-Women-of-Ido-Ondo.pdf).
7. Obeagu EI, Obeagu GU. Sick Cell Anaemia in Pregnancy: A Review. International Research in Medical and Health Sciences. 2023 Jun 10;6(2):10-3. <http://irmhs.com/index.php/irmhs/article/view/111>.
8. Jakheng SP, Obeagu EI. Seroprevalence of human immunodeficiency virus based on demographic and risk factors among pregnant women attending clinics in Zaria Metropolis, Nigeria. J Pub Health Nutri. 2022; 5 (8). 2022;137. [links/6317a6b1acd814437f0ad268/Seroprevalence-of-human-immunodeficiency-virus-based-on-demographic-and-risk-factors-among-pregnant-women-attending-clinics-in-Zaria-Metropolis-Nigeria.pdf](https://epjournals.com/journals/EJHIV/links/6317a6b1acd814437f0ad268/Seroprevalence-of-human-immunodeficiency-virus-based-on-demographic-and-risk-factors-among-pregnant-women-attending-clinics-in-Zaria-Metropolis-Nigeria.pdf).
9. Obeagu EI, Obeagu GU, Chukwueze CM, Ikpenwa JN, Ramos GF. Evaluation of Protein C, Protein S and Fibrinogen of Pregnant Women with Malaria in Owerri Metropolis. Madonna University journal of Medicine and Health Sciences. 2022;2(2):1-9.
10. Obeagu EI, Ikpenwa JN, Chukwueze CM, Obeagu GU. Evaluation of protein C, protein S and fibrinogen of pregnant women in Owerri Metropolis. Madonna University Journal of Medicine and Health Sciences. 2022;2(1):292-8. <https://madonnauniversity.edu.ng/journals/index.php/medicine/article/view/57>.
11. Obeagu EI, Obeagu GU, Adepoju OJ. Evaluation of haematological parameters of pregnant women based on age groups in Olorunsogo road area of Ido, Ondo state. J. Bio. Innov11 (3). 2022:936-41.
12. Obeagu EI. An update on utilization of antenatal care among pregnant Women in Nigeria. Int. J. Curr. Res. Chem. Pharm. Sci. 2022;9(9):21-6.DOI: [10.22192/ijcrps.2022.09.09.003](https://doi.org/10.22192/ijcrps.2022.09.09.003)
13. Okoroiwu IL, Obeagu EI, Obeagu GU. Determination of clot retraction in pregnant women attending antenatal clinic in federal medical centre Owerri, Nigeria. Madonna University Journal of Medicine and Health Sciences. 2022;2(2):91-7. <https://madonnauniversity.edu.ng/journals/index.php/medicine/article/view/67>.
14. Obeagu EI, Hassan AO, Adepoju OJ, Obeagu GU, Okafor CJ. Evaluation of Changes in Haematological Parameters of Pregnant Women Based on Gestational Age at Olorunsogo Road Area of Ido, Ondo State. Nigeria. Journal of Research in Medical and Dental Science. 2021;9(12):462-. [links/61b1e32f0c4bfb675178bfa7/Evaluation-of-Changes-in-Haematological-Parameters-of-Pregnant-Women-Based-on-Gestational-Age-at-Olorunsogo-Road-Area-of-Ido-Ondo-State-Nigeria.pdf](https://epjournals.com/journals/EJHIV/links/61b1e32f0c4bfb675178bfa7/Evaluation-of-Changes-in-Haematological-Parameters-of-Pregnant-Women-Based-on-Gestational-Age-at-Olorunsogo-Road-Area-of-Ido-Ondo-State-Nigeria.pdf).
15. Anyiam AF, Obeagu EI, Obi E, Omosigho PO, Ironde EA, Arinze-Anyiam OC, Asiyah MK. ABO blood groups and gestational diabetes among pregnant women attending University of Ilorin Teaching Hospital, Kwara State, Nigeria. International Journal of Research and Reports in Hematology. 2022 Jun 21;5(2):113-121.
16. Obeagu EI. Gestational Thrombocytopaenia. J Gynecol Women's Health. 2023;25(3):556163. [links/64b01aa88de7ed28ba95fccb/Gestational-Thrombocytopaenia.pdf](https://epjournals.com/journals/EJHIV/links/64b01aa88de7ed28ba95fccb/Gestational-Thrombocytopaenia.pdf).

Citation: Obeagu EI, Obeagu GU. Implications of Erythropoietin in the Prevention and Treatment of Preeclampsia in HIV-Positive Pregnant Women. Elite Journal of HIV, 2024; 2(3): 1-13

17. Jakheng SP, Obeagu EI, Abdullahi IO, Jakheng EW, Chukwueze CM, Eze GC, Essien UC, Madekwe CC, Madekwe CC, Vidya S, Kumar S. Distribution Rate of Chlamydial Infection According to Demographic Factors among Pregnant Women Attending Clinics in Zaria Metropolis, Kaduna State, Nigeria. *South Asian Journal of Research in Microbiology*. 2022 Aug 9;13(2):26-31.
18. Obeagu EI, Ogbonna US, Nwachukwu AC, Ochiabuto O, Enweani IB, Ezeoru VC. Prevalence of Malaria with Anaemia and HIV status in women of reproductive age in Onitsha, Nigeria. *Journal of Pharmaceutical Research International*. 2021 Feb 23;33(4):10-9.
19. Obeagu EI, Okwuanaso CB, Edoho SH, Obeagu GU. Under-nutrition among HIV-exposed Uninfected Children: A Review of African Perspective. *Madonna University journal of Medicine and Health Sciences*. 2022;2(3):120-127.
20. Obeagu EI, Alum EU, Obeagu GU. Factors associated with prevalence of HIV among youths: A review of Africa perspective. *Madonna University journal of Medicine and Health Sciences*. 2023;3(1):13-18.
<https://madonnauniversity.edu.ng/journals/index.php/medicine/article/view/93>.
21. Obeagu EI. A Review of Challenges and Coping Strategies Faced by HIV/AIDS Discordant Couples. *Madonna University journal of Medicine and Health Sciences*. 2023 ;3(1):7-12.
<https://madonnauniversity.edu.ng/journals/index.php/medicine/article/view/91>.
22. Obeagu EI, Obeagu GU. An update on premalignant cervical lesions and cervical cancer screening services among HIV positive women. *J Pub Health Nutri*. 2023; 6 (2). 2023; 141:1-2. [links/63e538ed64252375639dd0df/An-update-on-premalignant-cervical-lesions-and-cervical-cancer-screening-services-among-HIV-positive-women.pdf](https://doi.org/10.22192/ijcrms.2017.03.01.004).
23. Ezeoru VC, Enweani IB, Ochiabuto O, Nwachukwu AC, Ogbonna US, Obeagu EI. Prevalence of Malaria with Anaemia and HIV status in women of reproductive age in Onitsha, Nigeria. *Journal of Pharmaceutical Research International*. 2021;33(4):10-19.
24. Omo-Emmanuel UK, Chinedum OK, Obeagu EI. Evaluation of laboratory logistics management information system in HIV/AIDS comprehensive health facilities in Bayelsa State, Nigeria. *Int J Curr Res Med Sci*. 2017;3(1): 21-38.DOI: [10.22192/ijcrms.2017.03.01.004](https://doi.org/10.22192/ijcrms.2017.03.01.004)
25. Obeagu EI, Obeagu GU, Musiimenta E, Bot YS, Hassan AO. Factors contributing to low utilization of HIV counseling and testing services. *Int. J. Curr. Res. Med. Sci*. 2023;9(2): 1-5.DOI: [10.22192/ijcrms.2023.09.02.001](https://doi.org/10.22192/ijcrms.2023.09.02.001)
26. Obeagu EI, Obeagu GU. An update on survival of people living with HIV in Nigeria. *J Pub Health Nutri*. 2022; 5 (6). 2022;129. [links/645b4bfcf3512f1cc5885784/An-update-on-survival-of-people-living-with-HIV-in-Nigeria.pdf](https://doi.org/10.22192/ijcrms.2023.09.02.001).
27. Offie DC, Obeagu EI, Akueshi C, Njab JE, Ekanem EE, Dike PN, Oguh DN. Facilitators and barriers to retention in HIV care among HIV infected MSM attending Community Health Center Yaba, Lagos Nigeria. *Journal of Pharmaceutical Research International*. 2021;33(52B):10-19.

Citation: Obeagu EI, Obeagu GU. Implications of Erythropoietin in the Prevention and Treatment of Preeclampsia in HIV-Positive Pregnant Women. *Elite Journal of HIV*, 2024; 2(3): 1-13

28. Obeagu EI, Ogbonna US, Nwachukwu AC, Ochiabuto O, Enweani IB, Ezeoru VC. Prevalence of Malaria with Anaemia and HIV status in women of reproductive age in Onitsha, Nigeria. *Journal of Pharmaceutical Research International*. 2021;33(4):10-19.
29. Odo M, Ochei KC, Obeagu EI, Barinaadaa A, Eteng UE, Ikpeme M, Bassey JO, Paul AO. TB Infection Control in TB/HIV Settings in Cross River State, Nigeria: Policy Vs Practice. *Journal of Pharmaceutical Research International*. 2020;32(22):101-119.
30. Obeagu EI, Eze VU, Alaebob EA, Ochei KC. Determination of haematocrit level and iron profile study among persons living with HIV in Umuahia, Abia State, Nigeria. *J BioInnovation*. 2016; 5:464-471. [links/592bb4990f7e9b9979a975cf/DETERMINATION-OF-HAEMATOCRIT-LEVEL-AND-IRON-PROFILE-STUDY-AMONG-PERSONS-LIVING-WITH-HIV-IN-UMUAHIA-ABIA-STATE-NIGERIA.pdf](https://www.researchgate.net/publication/312592592-DETERMINATION-OF-HAEMATOCRIT-LEVEL-AND-IRON-PROFILE-STUDY-AMONG-PERSONS-LIVING-WITH-HIV-IN-UMUAHIA-ABIA-STATE-NIGERIA).
31. Ifeanyi OE, Obeagu GU. The values of prothrombin time among HIV positive patients in FMC owerri. *International Journal of Current Microbiology and Applied Sciences*. 2015;4(4):911-916. https://www.academia.edu/download/38320140/Obeagu_Emanuel_Ifeanyi_and_Obeagu_Getrude_Uzoma2.EMMA1.pdf.
32. Izuchukwu IF, Ozims SJ, Agu GC, Obeagu EI, Onu I, Amah H, Nwosu DC, Nwanjo HU, Edward A, Arunsi MO. Knowledge of preventive measures and management of HIV/AIDS victims among parents in Umuna Orlu community of Imo state Nigeria. *Int. J. Adv. Res. Biol. Sci*. 2016;3(10): 55-65.DOI; [10.22192/ijarbs.2016.03.10.009](https://doi.org/10.22192/ijarbs.2016.03.10.009)
33. Obeagu EI, Okoroiwu IL, Obeagu G. Molecular mechanism and systemic response of erythropoietin: A Review. *Int. J. Adv. Res. Biol. Sci*. 2015;2(7):58-62.
34. Obeagu EI, Okoroiwu II, Ezimah AC. Evaluation of serum erythropoietin levels in chronic kidney disease patients in Federal Medical centre, Umuahia, Nigeria. *Int. J. Curr. Res. Biol. Med*. 2016;1(4):15-21.
35. Obeagu EI. Erythropoietin in Sick Cell Anaemia: A Review. *International Journal of Research Studies in Medical and Health Sciences*. 2020;5(2):22-28.
36. Obeagu EI, Ezimah AC, Obeagu GU. Erythropoietin in the anaemias of pregnancy: a review. *Int J Curr Res Chem Pharm Sci*. 2016;3(3):10-18.
37. Obeagu EI, Ochei KC, Okeke EI, Anode AC. Assessment of the level of haemoglobin and erythropoietin in persons living with HIV in Umuahia. *Int. J. Curr. Res. Med. Sci*. 2016;2(4):29-33.
38. Obeagu EI, Obeagu GU, Nchuma BO, Amazue PO. A Review on erythropoietin receptor (EpoR). *Int. J. Adv. Res. Biol. Sci*. 2015;2(8):80-84.
39. Obeagu EI. Erythrocyte enumeration and serum erythropoietin in chronic kidney disease patients: A study in Federal Medical Centre, Umuahia, Nigeria. *International Journal of Advanced Research in Biological Sciences*. 2016;3(7):163-170.
40. Ifeanyi OE. A review on erythropoietin. *Int J Adv Res Biol Sci*. 2015;2(4):35-47.
41. Obeagu EI. Maximizing longevity: erythropoietin's impact on sickle cell anemia survival rates. *Annals of Medicine and Surgery*. 2024;10-97.
42. Ifeanyi OE, Uzoma OG. A review on erythropoietin in pregnancy. *J. Gynecol. Womens Health*. 2018;8(3):1-4.

Citation: Obeagu EI, Obeagu GU. Implications of Erythropoietin in the Prevention and Treatment of Preeclampsia in HIV-Positive Pregnant Women. *Elite Journal of HIV*, 2024; 2(3): 1-13

43. Chinedu K, Takim AE, Obeagu EI, Chinazor UD, Eloghosa O, Ojong OE, Odunze U. HIV and TB co-infection among patients who used Directly Observed Treatment Short-course centres in Yenagoa, Nigeria. IOSR J Pharm Biol Sci. 2017;12(4):70-75. [links/5988ab6d0f7e9b6c8539f73d/HIV-and-TB-co-infection-among-patients-who-used-Directly-Observed-Treatment-Short-course-centres-in-Yenagoa-Nigeria.pdf](https://www.iosrjournals.org/IOSRjournal/2017/12(4)/5988ab6d0f7e9b6c8539f73d/HIV-and-TB-co-infection-among-patients-who-used-Directly-Observed-Treatment-Short-course-centres-in-Yenagoa-Nigeria.pdf)
44. Oloro OH, Oke TO, Obeagu EI. Evaluation of Coagulation Profile Patients with Pulmonary Tuberculosis and Human Immunodeficiency Virus in Owo, Ondo State, Nigeria. Madonna University journal of Medicine and Health Sciences. 2022;2(3):110-119.
45. Nwosu DC, Obeagu EI, Nkwocha BC, Nwanna CA, Nwanjo HU, Amadike JN, Elendu HN, Ofoedeme CN, Ozims SJ, Nwankpa P. Change in Lipid Peroxidation Marker (MDA) and Non enzymatic Antioxidants (VIT C & E) in HIV Seropositive Children in an Urban Community of Abia State. Nigeria. J. Bio. Innov. 2016;5(1):24-30. [links/5ae735e9a6fdcc5b33eb8d6a/CHANGE-IN-LIPID-PEROXIDATION-MARKER-MDAAND-NON-ENZYMATIC-ANTIOXIDANTS-VIT-C-E-IN-HIV-SEROPOSITIVE-CHILDREN-IN-AN-URBAN-COMMUNITY-OF-ABIA-STATE-NIGERIA.pdf](https://www.researchgate.net/publication/311111111/links/5ae735e9a6fdcc5b33eb8d6a/CHANGE-IN-LIPID-PEROXIDATION-MARKER-MDAAND-NON-ENZYMATIC-ANTIOXIDANTS-VIT-C-E-IN-HIV-SEROPOSITIVE-CHILDREN-IN-AN-URBAN-COMMUNITY-OF-ABIA-STATE-NIGERIA.pdf).
46. Igwe CM, Obeagu IE, Ogbuabor OA. Clinical characteristics of people living with HIV/AIDS on ART in 2014 at tertiary health institutions in Enugu, Nigeria. J Pub Health Nutri. 2022; 5 (6). 2022;130. [links/645a166f5762c95ac3817d32/Clinical-characteristics-of-people-living-with-HIV-AIDS-on-ART-in-2014-at-tertiary-health-institutions-in-Enugu.pdf](https://www.researchgate.net/publication/358111111/links/645a166f5762c95ac3817d32/Clinical-characteristics-of-people-living-with-HIV-AIDS-on-ART-in-2014-at-tertiary-health-institutions-in-Enugu.pdf).
47. Ifeanyi OE, Obeagu GU, Ijeoma FO, Chioma UI. The values of activated partial thromboplastin time (APTT) among HIV positive patients in FMC Owerri. Int J Curr Res Aca Rev. 2015; 3:139-144. https://www.academia.edu/download/38320159/Obeagu_Emanuel_Ifeanyi3_et_al.IJC_RAR.pdf.
48. Obiomah CF, Obeagu EI, Ochei KC, Swem CA, Amachukwu BO. Hematological indices o HIV seropositive subjects in Nnamdi Azikiwe University teaching hospital (NAUTH), Nnewi. Ann Clin Lab Res. 2018;6(1):1-4. [links/5aa2bb17a6fdccd544b7526e/Haematological-Indices-of-HIV-Seropositive-Subjects-at-Nnamdi-Azikiwe.pdf](https://www.researchgate.net/publication/328111111/links/5aa2bb17a6fdccd544b7526e/Haematological-Indices-of-HIV-Seropositive-Subjects-at-Nnamdi-Azikiwe.pdf)
49. Omo-Emmanuel UK, Ochei KC, Osuala EO, Obeagu EI, Onwuasoanya UF. Impact of prevention of mother to child transmission (PMTCT) of HIV on positivity rate in Kafanchan, Nigeria. Int. J. Curr. Res. Med. Sci. 2017;3(2): 28-34.DOI: 10.22192/ijcrms.2017.03.02.005
50. Aizaz M, Abbas FA, Abbas A, Tabassum S, Obeagu EI. Alarming rise in HIV cases in Pakistan: Challenges and future recommendations at hand. Health Science Reports. 2023;6(8):e1450.
51. Obeagu EI, Amekpor F, Scott GY. An update of human immunodeficiency virus infection: Bleeding disorders. J Pub Health Nutri. 2023; 6 (1). 2023;139. [links/645b4a6c2edb8e5f094d9bd9/An-update-of-human-immunodeficiency-virus-infection-Bleeding.pdf](https://www.researchgate.net/publication/368111111/links/645b4a6c2edb8e5f094d9bd9/An-update-of-human-immunodeficiency-virus-infection-Bleeding.pdf).

Citation: Obeagu EI, Obeagu GU. Implications of Erythropoietin in the Prevention and Treatment of Preeclampsia in HIV-Positive Pregnant Women. Elite Journal of HIV, 2024; 2(3): 1-13

52. Obeagu EI, Scott GY, Amekpor F, Ofodile AC, Edoho SH, Ahamefula C. Prevention of New Cases of Human Immunodeficiency Virus: Pragmatic Approaches of Saving Life in Developing Countries. *Madonna University journal of Medicine and Health Sciences*. 2022;2(3):128-134.
<https://madonnauniversity.edu.ng/journals/index.php/medicine/article/view/86>.
53. Walter O, Anaabo QB, Obeagu EI, Okoroiwu IL. Evaluation of Activated Partial Thromboplastin Time and Prothrombin Time in HIV and TB Patients in Owerri Metropolis. *Journal of Pharmaceutical Research International*. 2022;29-34.
54. Odo M, Ochei KC, Obeagu EI, Barinaadaa A, Eteng EU, Ikpeme M, Bassey JO, Paul AO. Cascade variabilities in TB case finding among people living with HIV and the use of IPT: assessment in three levels of care in cross River State, Nigeria. *Journal of Pharmaceutical Research International*. 2020;32(24):9-18.
55. Jakheng SP, Obeagu EI. Seroprevalence of human immunodeficiency virus based on demographic and risk factors among pregnant women attending clinics in Zaria Metropolis, Nigeria. *J Pub Health Nutri*. 2022; 5 (8). 2022;137.
[links/6317a6b1acd814437f0ad268/Seroprevalence-of-human-immunodeficiency-virus-based-on-demographic-and-risk-factors-among-pregnant-women-attending-clinics-in-Zaria-Metropolis-Nigeria.pdf](https://www.researchgate.net/publication/361746144/Seroprevalence-of-human-immunodeficiency-virus-based-on-demographic-and-risk-factors-among-pregnant-women-attending-clinics-in-Zaria-Metropolis-Nigeria.pdf).
56. Obeagu EI, Obeagu GU. A Review of knowledge, attitudes and socio-demographic factors associated with non-adherence to antiretroviral therapy among people living with HIV/AIDS. *Int. J. Adv. Res. Biol. Sci*. 2023;10(9):135-142.DOI: 10.22192/ijarbs.2023.10.09.015 [links/6516faa61e2386049de5e828/A-Review-of-knowledge-attitudes-and-socio-demographic-factors-associated-with-non-adherence-to-antiretroviral-therapy-among-people-living-with-HIV-AIDS.pdf](https://www.researchgate.net/publication/36516faa61e2386049de5e828/A-Review-of-knowledge-attitudes-and-socio-demographic-factors-associated-with-non-adherence-to-antiretroviral-therapy-among-people-living-with-HIV-AIDS.pdf)
57. Obeagu EI, Onuoha EC. Tuberculosis among HIV Patients: A review of Prevalence and Associated Factors. *Int. J. Adv. Res. Biol. Sci*. 2023;10(9):128-134.DOI: 10.22192/ijarbs.2023.10.09.014 [links/6516f938b0df2f20a2f8b0e0/Tuberculosis-among-HIV-Patients-A-review-of-Prevalence-and-Associated-Factors.pdf](https://www.researchgate.net/publication/36516f938b0df2f20a2f8b0e0/Tuberculosis-among-HIV-Patients-A-review-of-Prevalence-and-Associated-Factors.pdf).
58. Obeagu EI, Ibeh NC, Nwobodo HA, Ochei KC, Iwegbulam CP. Haematological indices of malaria patients coinfectd with HIV in Umuahia. *Int. J. Curr. Res. Med. Sci*. 2017;3(5):100-104.DOI: 10.22192/ijcrms.2017.03.05.014
[https://www.academia.edu/download/54317126/Haematological indices of malaria patients coinfectd with HIV.pdf](https://www.academia.edu/download/54317126/Haematological_indices_of_malaria_patients_coinfectd_with_HIV.pdf)
59. Obeagu EI, Abdirahman BF, Bunu UO, Obeagu GU. Obsterics characteristics that effect the newborn outcomes. *Int. J. Adv. Res. Biol. Sci*. 2023;10(3):134-43.DOI: 10.22192/ijarbs.2023.10.03.016
60. Obeagu EI, Ogunnaya FU. PREGNANCYINDUCED HAEMATOLOGICAL CHANGES: A KEY TO MARTERNAL AND CHILD HEALTH. *European Journal of Biomedical*. 2023;10(8):42-3. [links/64c890bddb38b20d6dad2c5c/PREGNANCY-INDUCED-HAEMATOLOGICAL-CHANGES-A-KEY-TO-MARTERNAL-AND-CHILD-HEALTH.pdf](https://www.researchgate.net/publication/364c890bddb38b20d6dad2c5c/PREGNANCY-INDUCED-HAEMATOLOGICAL-CHANGES-A-KEY-TO-MARTERNAL-AND-CHILD-HEALTH.pdf).

Citation: Obeagu EI, Obeagu GU. Implications of Erythropoietin in the Prevention and Treatment of Preeclampsia in HIV-Positive Pregnant Women. *Elite Journal of HIV*, 2024; 2(3): 1-13

61. Ezeoru VC, Enweani IB, Ochiabuto O, Nwachukwu AC, Ogbonna US, Obeagu EI. Prevalence of Malaria with Anaemia and HIV status in women of reproductive age in Onitsha, Nigeria. *Journal of Pharmaceutical Research International*. 2021;33(4):10-9.
62. Okamgba OC, Nwosu DC, Nwobodo EI, Agu GC, Ozims SJ, Obeagu EI, Ibanga IE, Obioma-Elemba IE, Ihekaire DE, Obasi CC, Amah HC. Iron Status of Pregnant and Post-Partum Women with Malaria Parasitaemia in Aba Abia State, Nigeria. *Annals of Clinical and Laboratory Research*. 2017;5(4):206. [links/5ea97df145851592d6a8acf2/Iron-Status-of-Pregnant-and-Post-Partum-Women-with-Malaria-Parasitaemia-in-Aba-Abia-State-Nigeria.pdf](https://doi.org/10.22192/5ea97df145851592d6a8acf2/Iron-Status-of-Pregnant-and-Post-Partum-Women-with-Malaria-Parasitaemia-in-Aba-Abia-State-Nigeria.pdf).
63. Eze RI, Obeagu EI, Edet FN. Frequency of Rh Antigen C And c among pregnant women in Sub-Urban area in Eastern Nigeria. *Madonna Uni J Med Health Sci*. 2021;1(1):19-30.
64. Obeagu EI, Ofodile AC, Okwuanaso CB. A review of urinary tract infections in pregnant women: Risks factors. *J Pub Health Nutri*. 2023; 6 (1). 2023;137:26-35. [links/63c3a9116fe15d6a571e8bba/A-review-of-urinary-tract-infections-in-pregnant-women-Risks-factors.pdf](https://doi.org/10.22192/63c3a9116fe15d6a571e8bba/A-review-of-urinary-tract-infections-in-pregnant-women-Risks-factors.pdf).
65. Obeagu EI, Obeagu GU, Musiimenta E. Post partum haemorrhage among pregnant women: Update on risks factors. *Int. J. Curr. Res. Med. Sci*. 2023;9(2):14-7.DOI: [10.22192/ijcrms.2023.09.02.003](https://doi.org/10.22192/ijcrms.2023.09.02.003)
66. Obeagu EI, Obeagu GU, Ogunnaya FU. Deep vein thrombosis in pregnancy: A review of prevalence and risk factors. *Int. J. Curr. Res. Chem. Pharm. Sci*. 2023;10(8):14-21.DOI: [10.22192/ijcrps.2023.10.08.002](https://doi.org/10.22192/ijcrps.2023.10.08.002)
67. Jakheng SP, Obeagu EI, Jakheng EW, Uwakwe OS, Eze GC, Obeagu GU, Vidya S, Kumar S. Occurrence of Chlamydial Infection Based on Clinical Symptoms and Clinical History among Pregnant Women Attending Clinics in Zaria Metropolis, Kaduna State, Nigeria. *International Journal of Research and Reports in Gynaecology*. 2022;5(3):98-105.
68. Okorie HM, Obeagu EI, Eze EN, Jeremiah ZA. Assessment of some haematological parameters in malaria infected pregnant women in Imo state Nigeria. *Int. J. Curr. Res. Biol. Med*. 2018;3(9):1-4.DOI: [10.22192/ijcrbm.2018.03.09.001](https://doi.org/10.22192/ijcrbm.2018.03.09.001)
69. Onyenweaku FC, Amah HC, Obeagu EI, Nwandikor UU, Onwuasoanya UF. Prevalence of asymptomatic bacteriuria and its antibiotic susceptibility pattern in pregnant women attending private ante natal clinics in Umuahia Metropolitan. *Int J Curr Res Biol Med*. 2017;2(2):13-23.DOI: [10.22192/ijcrbm.2017.02.02.003](https://doi.org/10.22192/ijcrbm.2017.02.02.003)
70. Okoroiwu IL, Chinedu-Madu JU, Obeagu EI, Vincent CC, Ochiabuto OM, Ibekwe AM, Amaechi CO, Agu CC, Anoh NV, Amadi NM. Evaluation of Iron Status, Haemoglobin and Protein Levels of Pregnant Women in Owerri Metropolis. *Journal of Pharmaceutical Research International*. 2021 Apr 29;33(27A):36-43.
71. Obeagu EI, Njar VE, Obeagu GU. Infertility: Prevalence and Consequences. *Int. J. Curr. Res. Chem. Pharm. Sci*. 2023;10(7):43-50.
72. Emeka-Obi OR, Ibeh NC, Obeagu EI, Okorie HM. Evaluation of levels of some inflammatory cytokines in preeclamptic women in owerri. *Journal of Pharmaceutical Research International*. 2021 Aug 25;33(42A):53-65.
73. Obeagu EI, Faduma MH, Uzoma G. Ectopic Pregnancy: A Review. *Int. J. Curr. Res. Chem. Pharm. Sci*. 2023;10(4):40-4.DOI: [10.22192/ijcrps.2023.10.04.004](https://doi.org/10.22192/ijcrps.2023.10.04.004)

Citation: Obeagu EI, Obeagu GU. Implications of Erythropoietin in the Prevention and Treatment of Preeclampsia in HIV-Positive Pregnant Women. *Elite Journal of HIV*, 2024; 2(3): 1-13

74. Obeagu EI, Gamade SM, Obeagu GU. The roles of Neutrophils in pregnancy. *Int. J. Curr. Res. Med. Sci.* 2023;9(5):31-5.DOI: [10.22192/ijcrms.2023.09.05.005](https://doi.org/10.22192/ijcrms.2023.09.05.005)
75. Eze R, Obeagu EI, Nwakulite A, Okoroiwu IL, Vincent CC, Okafor CJ, Chukwurah EF, Chijioke UO, Amaechi CO. Evaluation of Copper Status and Some Red Cell Parameters of Pregnant Women in Enugu State, South Eastern Nigeria. *Journal of Pharmaceutical Research International*. 2021 May 29;33(30A):67-71.
76. Obeagu EI, Obeagu GU. Molar Pregnancy: Update of prevalence and risk factors. *Int. J. Curr. Res. Med. Sci.* 2023;9(7):25-8.DOI: [10.22192/ijcrms.2023.09.07.005](https://doi.org/10.22192/ijcrms.2023.09.07.005)
77. Obeagu EI, Bunu UO. Factors that influence unmet need for family planning. *International Journal of Current Research in Biology and Medicine*. 2023;8(1):23-7.
78. Ibebuike JE, Ojie CA, Nwokike GI, Obeagu EI, Nwosu DC, Nwanjo HU, Agu GC, Ezenwuba CO, Nwagu SA, Akujuobi AU. Barriers to utilization of maternal health services in southern senatorial district of Cross Rivers state, Nigeria. *International Journal of Advanced Multidisciplinary Research*. 2017;4(8):1-9.DOI: [10.22192/ijamr.2017.04.08.001](https://doi.org/10.22192/ijamr.2017.04.08.001)
79. Emmanuel G, Martin O, Peter OS, Obeagu EI, Daniel K. Factors Influencing Early Neonatal Adverse Outcomes among Women with HIV with Post Dated Pregnancies Delivering at Kampala International University Teaching Hospital, Uganda. *Asian Journal of Pregnancy and Childbirth*. 2023 Jul 29;6(1):203-11. <http://research.sdpublishers.net/id/eprint/2819/>.
80. Okorie HM, Obeagu EI, Eze EN, Jeremiah ZA. Assessment of coagulation parameters in malaria infected pregnant women in Imo state, Nigeria. *International Journal of Current Research in Medical Sciences*. 2018;4(9):41-9.DOI: [10.22192/ijcrms.2018.04.09.006](https://doi.org/10.22192/ijcrms.2018.04.09.006)
81. Obeagu EI, Obeagu GU. Postpartum haemorrhage among women delivering through spontaneous vaginal delivery: Prevalence and risk factors. *Int. J. Curr. Res. Chem. Pharm. Sci.* 2023;10(8):22-6.DOI: [10.22192/ijcreps.2023.10.08.003](https://doi.org/10.22192/ijcreps.2023.10.08.003)
82. Obeagu E, Eze RI, Obeagu EI, Nnatuanya IN, Dara EC. ZINC LEVEL IN APPARENTLY PREGNANT WOMEN IN URBAN AREA. *Madonna University journal of Medicine and Health Sciences* ISSN: 2814-3035. 2022 Mar 2;2(1):134-48. <https://www.journal.madonnauniversity.edu.ng/index.php/medicine/article/view/40>.
83. Ogomaka IA, Obeagu EI. Malaria in Pregnancy Amidst Possession of Insecticide Treated Bed Nets (ITNs) in Orlu LGA of Imo State, Nigeria. *Journal of Pharmaceutical Research International*. 2021 Aug 25;33(41B):380-6.
84. Obeagu EI, Ogunnaya FU, Obeagu GU, Ndidi AC. SICKLE CELL ANAEMIA: A GESTATIONAL ENIGMA. migration. 2023;17:18.
85. Ifeanyi OE, Uzoma OG. A review on erythropoietin in pregnancy. *J. Gynecol. Womens Health*. 2018;8(3):1-4. https://www.academia.edu/download/56538560/A_Review_on_Erythropoietin_in_Pregnancy.pdf.
86. Ifeanyi OE. A review on pregnancy and haematology. *Int. J. Curr. Res. Biol. Med.* 2018;3(5):26-8.DOI: [10.22192/ijcrbm.2018.03.05.006](https://doi.org/10.22192/ijcrbm.2018.03.05.006)

Citation: Obeagu EI, Obeagu GU. Implications of Erythropoietin in the Prevention and Treatment of Preeclampsia in HIV-Positive Pregnant Women. *Elite Journal of HIV*, 2024; 2(3): 1-13

87. Nwosu DC, Nwanjo HU, Obeagu EI, Ibebuike JE, Ezeama MC. Ihekireh. Changes in liver enzymes and lipid profile of pregnant women with malaria in Owerri, Nigeria. *International Journal of Current Research and Academic Review*. 2015;3(5):376-83.
88. Ibebuike JE, Ojie CA, Nwokike GI, Obeagu EI, Nwosu DC, Nwanjo HU, Agu GC, Ezenwuba CO, Nwagu SA, Akujuobi AU. Factors that influence women's utilization of primary health care services in Calabar Cross river state, Nigeria. *Int. J. Curr. Res. Chem. Pharm. Sci*. 2017;4(7):28-33.
89. Eze R, Ezeah GA, Obeagu EI, Omeje C, Nwakulite A. Evaluation of iron status and some haematological parameters of pregnant women in Enugu, South Eastern Nigeria. *World Journal of Pharmaceutical and Medical Research*. 2021;7(5):251-4.
90. Elemchukwu Q, Obeagu EI, Ochei KC. Prevalence of Anaemia among Pregnant Women in Braithwaite Memorial Specialist Hospital (BMSH) Port Harcourt. *IOSR Journal of Pharmacy and Biological Sciences*. 2014;9(5):59-64.
91. Akandinda M, Obeagu EI, Katonera MT. Non Governmental Organizations and Women's Health Empowerment in Uganda: A Review. *Asian Research Journal of Gynaecology and Obstetrics*. 2022 Dec 14;8(3):12-6.
92. Vidya S. Sunil Kumar Shango Patience Emmanuel Jakheng, Emmanuel Ifeanyi Obeagu, Emmanuel William Jakheng, Onyekachi Splendid Uwakwe, Gloria Chizoba Eze, and Getrude Uzoma Obeagu (2022). Occurrence of Chlamydial Infection Based on Clinical Symptoms and Clinical History among Pregnant Women Attending Clinics in Zaria Metropolis, Kaduna State, Nigeria. *International Journal of Research and Reports in Gynaecology*.;5(3):98-105.
93. Obeagu EI, Okoroiwu IL, Obeagu GU. Relationship between Thrombopoietin and Interleukin 3: A Review. *Int J Curr Res Chem Pharm. Sci*. 2022;9(1):7-13.
94. Obeagu EI, Obeagu GU, Amilo GI. Haematological changes in patients of chronic kidney disease in Umuahia, Abia State, Nigeria. *Curr Trends Biomed Eng Biosci*. 2018; 11:34-7.
95. Obeagu EI, Okoroiwu IL, Azuonwu O. An update on hypoxic regulation of iron homeostasis and bone marrow environment. *Int. J. Curr. Res. Med. Sci*. 2018;4(10):42-8.
96. Obeagu EI. Blood Transfusion: A Powerful Process of Saving Anaemic Patients. *EC Emergency Medicine and Critical Care*. 2020;4(7):33-40.
97. Obeagu EI, Obeagu GU. Platelet Distribution Width (PDW) as a Prognostic Marker for Anemia Severity in HIV Patients: A Comprehensive Review. *Journal home page: http://www. journalijar. com*.;12(01).
98. Obeagu EI, Obeagu GU, Obiezu J, Ezeonwumelu C, Ogunnaya FU, Ngwoke AO, Emeka-Obi OR, Ugwu OP. Hematologic Support in HIV Patients: Blood Transfusion Strategies and Immunological Considerations. *APPLIED SCIENCES (NIJBAS)*. 2023;3(3).
99. Zhang X, Li QY, Xiao BG. Anti-inflammatory effect of erythropoietin therapy on experimental autoimmune encephalomyelitis. *International Journal of Neuroscience*. 2012;122(5):255-262.
100. Zhou ZW, Li F, Zheng ZT, Li YD, Chen TH, Gao WW, Chen JL, Zhang JN. Erythropoietin regulates immune/inflammatory reaction and improves neurological function outcomes in traumatic brain injury. *Brain and behavior*. 2017;7(11):e00827.

Citation: Obeagu EI, Obeagu GU. Implications of Erythropoietin in the Prevention and Treatment of Preeclampsia in HIV-Positive Pregnant Women. *Elite Journal of HIV*, 2024; 2(3): 1-13

101. Gamde MS, Obeagu EI. IRON DEFICIENCY ANAEMIA: ENEMICAL TO PREGNANCY. European Journal of Biomedical. 2023;10(9):272-5. [links/64f63358827074313ffaae7b/IRON-DEFICIENCY-ANAEMIA-ENEMICAL-TO-PREGNANCY.pdf](https://epjournals.com/journals/EJHIV/links/64f63358827074313ffaae7b/IRON-DEFICIENCY-ANAEMIA-ENEMICAL-TO-PREGNANCY.pdf).
102. Emeka-Obi OR, Ibeh NC, Obeagu EI, Okorie HM. Evaluation of levels of some inflammatory cytokines in preeclamptic women in owerri. Journal of Pharmaceutical Research International. 2021 Aug 25;33(42A):53-65.
103. Emeka-Obi OR, Ibeh NC, Obeagu EI, Okorie HM. Studies of Some Haemostatic Variables in Preeclamptic Women in Owerri, Imo State, Nigeria. Journal of Pharmaceutical Research International. 2021 Aug 30;33(42B):39-48.
104. Obeagu EI, Obeagu GU. Postpartum haemorrhage among women delivering through spontaneous vaginal delivery: Prevalence and risk factors. Int. J. Curr. Res. Chem. Pharm. Sci. 2023;10(8):22-6.
105. Obeagu EI, Obeagu GU. Sickel Cell Anaemia in Pregnancy: A Review. International Research in Medical and Health Sciences. 2023 Jun 10;6(2):10-3.

Citation: Obeagu EI, Obeagu GU. Implications of Erythropoietin in the Prevention and Treatment of Preeclampsia in HIV-Positive Pregnant Women. Elite Journal of HIV, 2024; 2(3): 1-13