

## Maternal Eosinophilic Responses in HIV-Positive Pregnant Women: A Review

\*Emmanuel Ifeanyi Obeagu<sup>1</sup> and Getrude Uzoma Obeagu<sup>2</sup>

<sup>1</sup>Department of Medical Laboratory Science, Kampala International University, Uganda.

<sup>2</sup>School of Nursing Science, Kampala International University, Uganda.

\*Corresponding authour: Emmanuel Ifeanyi Obeagu, [Department of Medical Laboratory Science, Kampala International University, Uganda, emmanuelobeagu@yahoo.com, ORCID: 0000-0002-4538-0161](#)

### Abstract

Human Immunodeficiency Virus (HIV) infection during pregnancy introduces complex alterations in the maternal immune system, impacting various facets of the host response. This comprehensive review focuses on the distinctive role of eosinophils in the immune milieu of HIV-positive pregnant women and explores the implications for vertical transmission and perinatal outcomes. By synthesizing findings from clinical studies, immunological assessments, and molecular investigations, this review aims to provide a holistic understanding of the intricate interplay between HIV infection and maternal eosinophilic responses. The influence of eosinophils on placental immune responses, modulation of cytokine networks, and potential effects on viral replication dynamics are examined in detail. Additionally, the impact of antiretroviral therapy (ART) on maternal eosinophilic responses is discussed, emphasizing its potential role in mitigating adverse effects associated with HIV infection during pregnancy.

**Keywords:** *HIV, pregnancy, maternal immune response, eosinophils, cytokines, immune modulation, vertical transmission, antiretroviral therapy, perinatal outcomes*

### Introduction

Human Immunodeficiency Virus (HIV) infection remains a global health concern, with significant implications for maternal and neonatal health. The intersection of HIV and pregnancy introduces a dynamic interplay between the viral pathogenesis and the maternal immune response. While much research has focused on the broader immune alterations in HIV-infected individuals, a

**Citation:** Obeagu EI, Obeagu GU. **Maternal Eosinophilic Responses in HIV-Positive Pregnant Women: A Review.** Elite Journal of Nursing and Health Science, 2024; 2(1): 32-47

nuanced understanding of the role played by eosinophils in pregnant women living with HIV has garnered increasing attention. Eosinophils, traditionally associated with allergic responses and parasitic infections, are emerging as key players in the intricate landscape of maternal immune responses during HIV-infected pregnancies.<sup>1-16</sup>

The physiological changes that accompany pregnancy, including alterations in the maternal immune system, are further complicated by the immune challenges posed by HIV. The unique immunomodulatory environment required to sustain fetal development is perturbed in the presence of HIV, and eosinophils, with their diverse functions, may hold the key to deciphering some of these complexities.<sup>17-27</sup> This review aims to explore the specific nuances of maternal eosinophilic responses in the context of HIV infection during pregnancy. By examining alterations in eosinophil counts, activation states, and cytokine profiles, we seek to unravel the multifaceted roles played by eosinophils in modulating the immune milieu. Understanding the implications of maternal eosinophilic responses is particularly crucial, not only for deciphering the mechanisms influencing vertical transmission but also for delineating potential avenues for therapeutic interventions aimed at improving perinatal outcomes.

## **Maternal and Fetal Health**

Maintaining maternal health through proper nutrition, exercise, and avoiding harmful substances is crucial for fetal well-being. Monitoring fetal movements, heart rate, and growth are integral components of prenatal care. The maternal immune response during pregnancy is a highly dynamic and complex process that undergoes significant adaptations to support the developing fetus while maintaining the mother's ability to defend against infections. This intricate interplay involves various components of the immune system, including cells, cytokines, and hormonal signals. The maternal immune system must tolerate the presence of the semi-allogeneic fetus (having paternal antigens) to prevent rejection. Immune tolerance is achieved through various mechanisms, including the expansion of regulatory T cells (Tregs) that suppress immune responses against fetal antigens.<sup>28-47</sup>

The decidua, the lining of the uterus during pregnancy, creates a unique immune microenvironment. Immune cells such as decidual natural killer (dNK) cells, macrophages, and dendritic cells play crucial roles in maintaining immune balance at the maternal-fetal interface. Hormones such as progesterone and estradiol produced during pregnancy modulate the maternal immune response. These hormones contribute to immune tolerance, inhibit certain immune responses, and promote a Th2-type immune profile. There is a shift in T cell subsets, with an increase in Th2 cells (which promote antibody production and immune tolerance) and a decrease in Th1 cells (which mediate cellular immunity and may be harmful to the fetus). Maternal antibodies, including IgG, are transferred across the placenta to provide passive immunity to the developing fetus. This transfer offers protection against certain infections during the early stages of life.<sup>48-58</sup>

**Citation:** Obeagu EI, Obeagu GU. **Maternal Eosinophilic Responses in HIV-Positive Pregnant Women: A Review.** Elite Journal of Nursing and Health Science, 2024; 2(1): 32-47

Innate immune responses, including activation of Toll-like receptors (TLRs) and production of antimicrobial peptides, are maintained to protect against infections without triggering harmful inflammatory responses. Controlled inflammation is necessary for proper implantation, placentation, and tissue remodeling during pregnancy. Imbalances in inflammatory responses may contribute to complications such as preterm birth and preeclampsia. Pregnancy poses challenges, as the immune system must balance protection against pathogens with tolerance to fetal antigens. Infections during pregnancy can have varying effects on the developing fetus, ranging from mild to severe depending on the timing and nature of the infection.<sup>59-68</sup>

## **Eosinophils**

Eosinophils are a type of white blood cell (leukocyte) that plays a significant role in the immune system, particularly in responding to parasitic infections and modulating inflammatory responses. These cells are characterized by the presence of distinctive granules in their cytoplasm that contain various proteins.<sup>69</sup> While eosinophils typically constitute a small proportion of the total white blood cell count, their functions are critical for maintaining immune homeostasis. Eosinophils are produced in the bone marrow from stem cells and develop into mature eosinophils under the influence of specific growth factors. Their differentiation is stimulated by interleukin-5 (IL-5), a cytokine produced by T cells and other immune cells. Eosinophils circulate in the bloodstream but are primarily found in tissues, especially at mucosal surfaces of the gastrointestinal, respiratory, and genitourinary tracts. Chemotactic signals guide eosinophils to sites of infection, inflammation, or tissue damage. Eosinophils contain characteristic granules that house an array of proteins, including major basic protein, eosinophil peroxidase, and eosinophil-derived neurotoxin. These proteins are involved in defense mechanisms against parasites and in modulating inflammatory responses.

Eosinophils play a crucial role in defending against parasitic infections. They release toxic granule contents to combat parasites and have surface receptors that recognize and bind to antibodies targeting parasites. In allergic reactions and asthma, eosinophils contribute to inflammation by releasing pro-inflammatory mediators. Eosinophils modulate inflammation by interacting with other immune cells and releasing cytokines and chemokines. They contribute to the resolution of inflammation by promoting tissue repair and remodeling. Eosinophilia refers to an elevated eosinophil count in the blood, which can occur in response to various conditions, including parasitic infections, allergies, autoimmune diseases, and certain cancers. Eosinophilia may be a sign of an underlying health issue and is often evaluated in clinical settings. Eosinophils have been implicated in modulating immune responses during pregnancy, particularly at the maternal-fetal interface. Changes in eosinophilic responses may contribute to immune tolerance necessary for successful pregnancies.

## **Cytokines**

Cytokines are small signaling molecules that play a crucial role in mediating communication among cells of the immune system and other tissues. These proteins are involved in coordinating

**Citation:** Obeagu EI, Obeagu GU. **Maternal Eosinophilic Responses in HIV-Positive Pregnant Women: A Review.** Elite Journal of Nursing and Health Science, 2024; 2(1): 32-47

immune responses, inflammation, and various physiological processes. Cytokines can be produced by a wide range of cells, including immune cells, endothelial cells, fibroblasts, and various stromal cells. They act in a paracrine or autocrine manner, influencing the behavior of nearby or the same cells that produce them. Cytokines are classified into different groups, including interleukins (IL), interferons (IFN), tumor necrosis factors (TNF), chemokines, and growth factors, based on their functions and structural similarities. Cytokines play a central role in regulating immune responses. They can stimulate or inhibit the activation, proliferation, and differentiation of immune cells such as T cells, B cells, and macrophages. Many cytokines are involved in the initiation, amplification, and resolution of inflammatory responses. They can recruit immune cells to sites of infection or tissue damage and mediate tissue repair. Cytokines regulate the growth and differentiation of various cell types, influencing processes like hematopoiesis, angiogenesis, and tissue development.<sup>70</sup>

Cytokines exert their effects by binding to specific cell surface receptors on target cells. Receptor engagement triggers intracellular signaling pathways, leading to changes in gene expression and cellular responses. IL-1, IL-6, TNF- $\alpha$ , and IFN- $\gamma$  are examples of cytokines that promote inflammation and immune responses. IL-10 and transforming growth factor-beta (TGF- $\beta$ ) are examples of cytokines that suppress inflammation and regulate immune responses. Chemokines are a subgroup of cytokines that specifically regulate the migration and localization of immune cells. They play a crucial role in directing immune cells to sites of infection or inflammation. Excessive or dysregulated cytokine production can lead to a cytokine storm, an exaggerated immune response associated with severe inflammation. Cytokine storms can occur in conditions such as severe infections, autoimmune diseases, and certain therapeutic interventions. Cytokines have therapeutic applications in conditions such as cancer and autoimmune diseases. Recombinant cytokines, such as interferons and interleukins, are used in immunotherapy. Cytokine inhibitors are employed to modulate excessive immune responses in diseases like rheumatoid arthritis and inflammatory bowel disease. Cytokines play a role in immune tolerance during pregnancy, influencing the maternal-fetal interface and supporting fetal development. Imbalances in cytokine profiles can contribute to pregnancy complications.<sup>70</sup>

## **Immune modulation**

Immune modulation refers to the process of adjusting or regulating the activity of the immune system to achieve a desired immune response. This can involve enhancing or suppressing immune responses, depending on the context and therapeutic goals. Immune modulation is a critical aspect of maintaining immune homeostasis, preventing autoimmunity, and combating infections or other immune-related disorders. Boosting the immune response to enhance the body's ability to recognize and eliminate pathogens or abnormal cells. Suppressing the immune response to prevent excessive inflammation, tissue damage, or autoimmune reactions. Various drugs and substances can modulate immune responses. Examples include immunosuppressive drugs (corticosteroids, calcineurin inhibitors) and immunostimulants (cytokines, growth factors). Monoclonal antibodies and other biologics are used to selectively target specific components of the immune system, influencing immune responses in a targeted manner. Immune modulation is a cornerstone of

**Citation:** Obeagu EI, Obeagu GU. **Maternal Eosinophilic Responses in HIV-Positive Pregnant Women: A Review.** Elite Journal of Nursing and Health Science, 2024; 2(1): 32-47

treating autoimmune diseases, where the immune system mistakenly attacks the body's own tissues. Immunosuppressive agents help control inflammation and prevent tissue damage in conditions like rheumatoid arthritis, lupus, and multiple sclerosis.<sup>71</sup>

Immune modulation is a key strategy in cancer immunotherapy, aiming to enhance the body's ability to recognize and eliminate cancer cells. Checkpoint inhibitors, adoptive cell therapies, and therapeutic vaccines are examples of cancer immunotherapies that modulate immune responses against cancer. Immune modulation is employed in the treatment of certain infectious diseases. For example, antiretroviral therapy in HIV aims to modulate the immune response against the virus. Vaccines are a form of immune modulation, priming the immune system to mount a protective response against specific pathogens. Immunosuppression is a critical component of organ transplantation to prevent graft rejection. Drugs like cyclosporine and tacrolimus modulate the immune response to allow the acceptance of transplanted organs. Immune modulation plays a role in establishing immune tolerance during pregnancy. The maternal immune system adapts to tolerate the semi-allogeneic fetus to prevent rejection. Changes in cytokine profiles and the balance of immune cells contribute to immune tolerance during pregnancy. Immune modulation helps maintain the delicate balance between pro-inflammatory and anti-inflammatory responses, preventing chronic inflammation associated with various diseases.<sup>72-92</sup>

### **Antiretroviral therapy (ART)**

Antiretroviral therapy (ART) is a medical intervention used to treat infections caused by retroviruses, with the most prominent example being the human immunodeficiency virus (HIV). ART is a cornerstone of HIV management and has significantly transformed the prognosis and quality of life for individuals living with HIV. The primary goal of ART is to suppress the replication of the virus, reducing the viral load in the body to undetectable levels. By controlling viral replication, ART helps preserve the immune system, prevent the progression to acquired immunodeficiency syndrome (AIDS), and reduce the risk of opportunistic infections. ART typically involves the use of a combination of antiretroviral drugs from different classes. The three main classes of antiretroviral drugs are: Inhibit reverse transcriptase, an enzyme necessary for viral replication. Highly Active Antiretroviral Therapy (HAART) involves the use of a combination of drugs from different classes. Combination therapy is more effective in suppressing viral replication and reducing the risk of drug resistance. ART is initiated based on specific clinical and immunological criteria, typically guided by the CD4 cell count and viral load. Early initiation of ART, regardless of CD4 count, is recommended in certain situations to improve outcomes and reduce transmission risk.<sup>92-101</sup>

Regular monitoring of viral load is essential to assess the effectiveness of ART. Achieving and maintaining an undetectable viral load is a primary goal of treatment. Adherence to the prescribed ART regimen is crucial for treatment success. Inconsistent adherence can lead to viral resistance and treatment failure. Antiretroviral drugs may cause side effects, and their severity varies among individuals. Common side effects include gastrointestinal symptoms, metabolic changes, and skin reactions. Close monitoring and communication with healthcare providers help manage and

**Citation:** Obeagu EI, Obeagu GU. **Maternal Eosinophilic Responses in HIV-Positive Pregnant Women: A Review.** Elite Journal of Nursing and Health Science, 2024; 2(1): 32-47

address side effects. ART is used during pregnancy to prevent vertical transmission of HIV from mother to child. Administering ART to pregnant women living with HIV significantly reduces the risk of transmission. PrEP involves the use of antiretroviral drugs by individuals at high risk of HIV infection to prevent transmission. Truvada (a combination of tenofovir and emtricitabine) is a commonly used drug for PrEP. Treatment guidelines for ART are periodically updated based on emerging research, new drug approvals, and advancements in the understanding of HIV.<sup>102-</sup>

## Conclusion

The dynamic interplay between HIV infection and eosinophils, traditionally associated with parasitic and allergic responses, unfolds new dimensions in the unique context of pregnancy. The immune tolerance established during pregnancy involves a delicate balance, and eosinophils emerge as key players in this intricate symphony. Their functions extend beyond the conventional roles, contributing to the modulation of inflammation, tissue repair, and potentially influencing the risk of certain pregnancy complications. In the realm of maternal and child health, where the stakes are high, the insights gleaned from this review contribute to a deeper understanding of the immune dynamics at play.

## References

1. 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.
2. 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>.
3. 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>.
4. 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://links/63e538ed64252375639dd0df/An-update-on-premalignant-cervical-lesions-and-cervical-cancer-screening-services-among-HIV-positive-women.pdf).
5. 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.
6. 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

**Citation:** Obeagu EI, Obeagu GU. **Maternal Eosinophilic Responses in HIV-Positive Pregnant Women: A Review.** Elite Journal of Nursing and Health Science, 2024; 2(1): 32-47



7. 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)
8. 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).
9. 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.
10. 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.
11. 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.
12. 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://doi.org/10.22192/ijcrms.2023.09.02.001).
13. 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](https://www.academia.edu/download/38320140/Obeagu_Emanuel_Ifeanyi_and_Obeagu_Getrude_Uzoma2.EMMA1.pdf).
14. 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)
15. 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://doi.org/10.22192/ijcrms.2023.09.02.001)
16. 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.
17. 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-](https://doi.org/10.22192/ijcrms.2023.09.02.001)

**Citation:** Obeagu EI, Obeagu GU. **Maternal Eosinophilic Responses in HIV-Positive Pregnant Women: A Review.** *Elite Journal of Nursing and Health Science*, 2024; 2(1): 32-47

[MDAAND-NON-ENZYMATIC-ANTIOXIDANTS-VIT-C-E-IN-HIV-SEROPOSITIVE-CHILDREN-IN-AN-URBAN-COMMUNITY-OF-ABIA-STATE-NIGERIA.pdf](#)

18. 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](#).
19. 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](https://www.academia.edu/download/38320159/Obeagu_Emanuel_Ifeanyi3_et_al.IJC_RAR.pdf).
20. 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](#)
21. 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
22. 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.
23. 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](#).
24. 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>.
25. Walter O, Anaebo 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.
26. 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.
27. Jakheng SP, Obeagu EI. Seroprevalence of human immunodeficiency virus based on demographic and risk factors among pregnant women attending clinics in Zaria Metropolis,

**Citation:** Obeagu EI, Obeagu GU. **Maternal Eosinophilic Responses in HIV-Positive Pregnant Women: A Review.** Elite Journal of Nursing and Health Science, 2024; 2(1): 32-47



- 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/EJNHS/links/6317a6b1acd814437f0ad268/Seroprevalence-of-human-immunodeficiency-virus-based-on-demographic-and-risk-factors-among-pregnant-women-attending-clinics-in-Zaria-Metropolis-Nigeria.pdf).
28. 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://epjournals.com/journals/EJNHS/links/63da799664fc860638054562/Anaemia-among-pregnant-women-A-review-of-African-pregnant-teenagers.pdf).
  29. 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://epjournals.com/journals/EJNHS/links/5710fae108ae846f4ef05afb/ERYTHROPOIETIN-IN-THE-ANAEMIAS-OF-PREGNANCY-A-REVIEW.pdf).
  30. 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/EJNHS/links/608a6728a6fdccaebdf52d94/Assessment-of-Haematological-Changes-in-Pregnant-Women-of-Ido-Ondo.pdf).
  31. 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>.
  32. 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/EJNHS/links/6317a6b1acd814437f0ad268/Seroprevalence-of-human-immunodeficiency-virus-based-on-demographic-and-risk-factors-among-pregnant-women-attending-clinics-in-Zaria-Metropolis-Nigeria.pdf).
  33. 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.
  34. 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>.
  35. 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.
  36. 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/ijcreps.2022.09.09.003](https://doi.org/10.22192/ijcreps.2022.09.09.003)
  37. 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>.
  38. 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

**Citation:** Obeagu EI, Obeagu GU. **Maternal Eosinophilic Responses in HIV-Positive Pregnant Women: A Review.** Elite Journal of Nursing and Health Science, 2024; 2(1): 32-47

- 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](#).
39. Anyiam AF, Obeagu EI, Obi E, Omosigho PO, Ironi 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.
  40. Obeagu EI. Gestational Thrombocytopaenia. J Gynecol Women's Health. 2023;25(3):556163. [links/64b01aa88de7ed28ba95fccb/Gestational-Thrombocytopaenia.pdf](#).
  41. 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.
  42. 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.
  43. Obeagu EI, Abdirahman BF, Bunu UO, Obeagu GU. Obstetrics 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](#)
  44. Obeagu EI, Ogunnaya FU. PREGNANCYINDUCED HAEMATOLOGICAL CHANGES: A KEY TO MATERNAL AND CHILD HEALTH. European Journal of Biomedical. 2023;10(8):42-3. [links/64c890bddb38b20d6dad2c5c/PREGNANCY-INDUCED-HAEMATOLOGICAL-CHANGES-A-KEY-TO-MATERNAL-AND-CHILD-HEALTH.pdf](#).
  45. 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.
  46. Okamgba OC, Nwosu DC, Nwobodo EI, Agu GC, Ozims SJ, Obeagu EI, Ibanga IE, Obioma-Elemba IE, Ihekai 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](#).
  47. 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.
  48. 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](#).

**Citation:** Obeagu EI, Obeagu GU. **Maternal Eosinophilic Responses in HIV-Positive Pregnant Women: A Review.** Elite Journal of Nursing and Health Science, 2024; 2(1): 32-47

49. 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)
50. 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)
51. 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.
52. 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)
53. 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)
54. 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.
55. Obeagu EI, Njar VE, Obeagu GU. Infertility: Prevalence and Consequences. *Int. J. Curr. Res. Chem. Pharm. Sci.* 2023;10(7):43-50.
56. 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.
57. 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)
58. 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)
59. 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.
60. 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)
61. 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.
62. 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)

**Citation:** Obeagu EI, Obeagu GU. **Maternal Eosinophilic Responses in HIV-Positive Pregnant Women: A Review.** *Elite Journal of Nursing and Health Science*, 2024; 2(1): 32-47

63. 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/>.
64. 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)
65. 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/ijcrmps.2023.10.08.003](https://doi.org/10.22192/ijcrmps.2023.10.08.003)
66. 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>.
67. 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.
68. Obeagu EI, Ogunnaya FU, Obeagu GU, Ndidi AC. SICKLE CELL ANAEMIA: A GESTATIONAL ENIGMA. migration. 2023;17:18.
69. Ramirez GA, Yacoub MR, Ripa M, Mannina D, Cariddi A, Saporiti N, Ciceri F, Castagna A, Colombo G, Dagna L. Eosinophils from physiology to disease: a comprehensive review. BioMed research international. 2018.
70. Haddad JJ. Cytokines and related receptor-mediated signaling pathways. Biochemical and biophysical research communications. 2002;297(4):700-13.
71. Cabral GA. Drugs of abuse, immune modulation, and AIDS. Journal of neuroimmune pharmacology. 2006;1:280-295.
72. 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](https://doi.org/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/374561604/A-Review-of-knowledge-attitudes-and-socio-demographic-factors-associated-with-non-adherence-to-antiretroviral-therapy-among-people-living-with-HIV-AIDS.pdf)
73. 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](https://doi.org/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/374561604/Tuberculosis-among-HIV-Patients-A-review-of-Prevalence-and-Associated-Factors.pdf).
74. 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://doi.org/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)

**Citation:** Obeagu EI, Obeagu GU. **Maternal Eosinophilic Responses in HIV-Positive Pregnant Women: A Review.** Elite Journal of Nursing and Health Science, 2024; 2(1): 32-47

75. 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;13(2):26-31.
76. Viola N, Kimono E, Nuruh N, Obeagu EI. Factors Hindering Elimination of Mother to Child Transmission of HIV Service Uptake among HIV Positive Women at Comboni Hospital Kyamuhunga Bushenyi District. *Asian Journal of Dental and Health Sciences*. 2023;3(2):7-14. <http://ajdhs.com/index.php/journal/article/view/39>.
77. Okorie HM, Obeagu Emmanuel I, Okpoli Henry CH, Chukwu Stella N. Comparative study of enzyme linked immunosorbent assay (Elisa) and rapid test screening methods on HIV, Hbsag, Hcv and Syphilis among voluntary donors in. Owerri, Nigeria. *J Clin Commun Med*. 2020;2(3):180-183.DOI: **DOI:** [10.32474/JCCM.2020.02.000137](https://doi.org/10.32474/JCCM.2020.02.000137)  
[links/5f344530458515b7291bd95f/Comparative-Study-of-Enzyme-Linked-Immunosorbent-Assay-ElISA-and-Rapid-Test-Screening-Methods-on-HIV-HBsAg-HCV-and-Syphilis-among-Voluntary-Donors-in-Owerri-Nigeria.pdf](https://doi.org/10.32474/JCCM.2020.02.000137).
78. Ezugwu UM, Onyenekwe CC, Ukibe NR, Ahaneku JE, Onah CE, Obeagu EI, Emeje PI, Awalu JC, Igbokwe GE. Use of ATP, GTP, ADP and AMP as an Index of Energy Utilization and Storage in HIV Infected Individuals at NAUTH, Nigeria: A Longitudinal, Prospective, Case-Controlled Study. *Journal of Pharmaceutical Research International*. 2021;33(47A):78-84.
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):203-211. <http://research.sdpublishers.net/id/eprint/2819/>.
80. Igwe MC, Obeagu EI, Ogbuabor AO, Eze GC, Ikpenwa JN, Eze-Steven PE. Socio-Demographic Variables of People Living with HIV/AIDS Initiated on ART in 2014 at Tertiary Health Institution in Enugu State. *Asian Journal of Research in Infectious Diseases*. 2022;10(4):1-7.
81. Vincent CC, Obeagu EI, Agu IS, Ukeagu NC, Onyekachi-Chigbu AC. Adherence to Antiretroviral Therapy among HIV/AIDS in Federal Medical Centre, Owerri. *Journal of Pharmaceutical Research International*. 2021;33(57A):360-368.
82. Igwe MC, Obeagu EI, Ogbuabor AO. ANALYSIS OF THE FACTORS AND PREDICTORS OF ADHERENCE TO HEALTHCARE OF PEOPLE LIVING WITH HIV/AIDS IN TERTIARY HEALTH INSTITUTIONS IN ENUGU STATE. *Madonna University journal of Medicine and Health Sciences*. 2022;2(3):42-57. <https://madonnauniversity.edu.ng/journals/index.php/medicine/article/view/75>.
83. Madekwe CC, Madekwe CC, Obeagu EI. Inequality of monitoring in Human Immunodeficiency Virus, Tuberculosis and Malaria: A Review. *Madonna University journal of Medicine and Health Sciences*. 2022;2(3):6-15. <https://madonnauniversity.edu.ng/journals/index.php/medicine/article/view/69>

**Citation:** Obeagu EI, Obeagu GU. **Maternal Eosinophilic Responses in HIV-Positive Pregnant Women: A Review.** *Elite Journal of Nursing and Health Science*, 2024; 2(1): 32-47



84. Echendu GE, Vincent CC, Ibebuiké J, Asodike M, Naze N, Chinedu EP, Ohale B, Obeagu EI. WEIGHTS OF INFANTS BORN TO HIV INFECTED MOTHERS: A PROSPECTIVE COHORT STUDY IN FEDERAL MEDICAL CENTRE, OWERRI, IMO STATE. *European Journal of Pharmaceutical and Medical Research*, 2023; 10(8): 564-568
85. Nwosu DC, Nwanjo HU, Okolie NJ, Ikeh K, Ajero CM, Dike J, Ojiegbe GC, Oze GO, Obeagu EI, Nnatunanya I, Azuonwu O. BIOCHEMICAL ALTERATIONS IN ADULT HIV PATIENTS ON ANTIRETROVIRAL THERAPY. *World Journal of Pharmacy and Pharmaceutical Sciences*, 2015; 4(3): 153-160.  
[links/5a4fd0500f7e9bbc10526b38/BIOCHEMICAL-ALTERATIONS-IN-ADULT-HIV-PATIENTS-ON-ANTIRETROVIRAL-THERAPY.pdf](https://www.wjpr.in/index.php/wjpr/article/view/5a4fd0500f7e9bbc10526b38/BIOCHEMICAL-ALTERATIONS-IN-ADULT-HIV-PATIENTS-ON-ANTIRETROVIRAL-THERAPY.pdf).
86. Obeagu EI, Obeagu GU. Effect of CD4 Counts on Coagulation Parameters among HIV Positive Patients in Federal Medical Centre, Owerri, Nigeria. *Int. J. Curr. Res. Biosci. Plant Biol.* 2015;2(4):45-49.
87. Obeagu EI, Nwosu DC. Adverse drug reactions in HIV/AIDS patients on highly active antiretro viral therapy: a review of prevalence. *Int. J. Curr. Res. Chem. Pharm. Sci.* 2019;6(12):45-8.DOI: [10.22192/ijcreps.2019.06.12.004](https://doi.org/10.22192/ijcreps.2019.06.12.004)  
[links/650aba1582f01628f0335795/Adverse-drug-reactions-in-HIV-AIDS-patients-on-highly-active-antiretro-viral-therapy-a-review-of-prevalence.pdf](https://www.ijcreps.com/index.php/ijcreps/article/view/links/650aba1582f01628f0335795/Adverse-drug-reactions-in-HIV-AIDS-patients-on-highly-active-antiretro-viral-therapy-a-review-of-prevalence.pdf).
88. Obeagu EI, Scott GY, Amekpor F, Obeagu GU. Implications of CD4/CD8 ratios in Human Immunodeficiency Virus infections. *Int. J. Curr. Res. Med. Sci.* 2023;9(2):6-13.DOI: [10.22192/ijcrms.2023.09.02.002](https://doi.org/10.22192/ijcrms.2023.09.02.002) [links/645a4a462edb8e5f094ad37c/Implications-of-CD4-CD8-ratios-in-Human-Immunodeficiency-Virus-infections.pdf](https://www.ijcrms.com/index.php/ijcrms/article/view/links/645a4a462edb8e5f094ad37c/Implications-of-CD4-CD8-ratios-in-Human-Immunodeficiency-Virus-infections.pdf).
89. 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. [links/5711c47508acebe07c02496b/Assessment-of-the-level-of-haemoglobin-and-erythropoietin-in-persons-living-with-HIV-in-Umuahia.pdf](https://www.ijcrms.com/index.php/ijcrms/article/view/links/5711c47508acebe07c02496b/Assessment-of-the-level-of-haemoglobin-and-erythropoietin-in-persons-living-with-HIV-in-Umuahia.pdf).
90. Ifeanyi OE, Obeagu GU. The Values of CD4 Count, among HIV Positive Patients in FMC Owerri. *Int. J. Curr. Microbiol. App. Sci.* 2015;4(4):906-910.  
[https://www.academia.edu/download/38320134/Obeagu Emmanuel Ifeanyi and Obeagu Getrude Uzoma.EMMA2.pdf](https://www.academia.edu/download/38320134/Obeagu_Emanuel_Ifeanyi_and_Obeagu_Getrude_Uzoma.EMMA2.pdf).
91. Obeagu EI, Okeke EI, Anonde Andrew C. Evaluation of haemoglobin and iron profile study among persons living with HIV in Umuahia, Abia state, Nigeria. *Int. J. Curr. Res. Biol. Med.* 2016;1(2):1-5.
92. Alum EU, Ugwu OP, Obeagu EI, Okon MB. Curtailing HIV/AIDS Spread: Impact of Religious Leaders. *Newport International Journal of Research in Medical Sciences (NIJ RMS)*. 2023;3(2):28-31.
93. Obeagu EI, Obeagu GU, Paul-Chima UO. Stigma Associated With HIV. *AIDS: A Review. Newport International Journal of Public Health and Pharmacy (NIJPP)*. 2023;3(2):64-67.
94. Alum EU, Obeagu EI, Ugwu OP, Aja PM, Okon MB. HIV Infection and Cardiovascular diseases: The obnoxious Duos. *Newport International Journal of Research in Medical Sciences (NIJ RMS)*. 2023;3(2):95-99.
95. Ibebuiké JE, Nwokike GI, Nwosu DC, Obeagu EI. A Retrospective Study on Human Immune Deficiency Virus among Pregnant Women Attending Antenatal Clinic in Imo

**Citation:** Obeagu EI, Obeagu GU. **Maternal Eosinophilic Responses in HIV-Positive Pregnant Women: A Review.** *Elite Journal of Nursing and Health Science*, 2024; 2(1): 32-47

State University Teaching Hospital. *International Journal of Medical Science and Dental Research*, 2018; 1 (2):08-14.  
<https://www.ijmsdr.org/published%20paper/li1i2/A%20Retrospective%20Study%20on%20Human%20Immune%20Deficiency%20Virus%20among%20Pregnant%20Women%20Attending%20Antenatal%20Clinic%20in%20Imo%20State%20University%20Teaching%20Hospital.pdf>.

96. Obeagu EI, Obarezi TN, Omeh YN, Okoro NK, Eze OB. Assessment of some haematological and biochemical parameters in HIV patients before receiving treatment in Aba, Abia State, Nigeria. *Res J Pharma Biol Chem Sci*. 2014; 5:825-830.
97. Obeagu EI, Obarezi TN, Ogbuabor BN, Anaebio QB, Eze GC. Pattern of total white blood cell and differential count values in HIV positive patients receiving treatment in Federal Teaching Hospital Abakaliki, Ebonyi State, Nigeria. *International Journal of Life Science, Biotechnology and Pharmacy Research*. 2014; 391:186-189.
98. 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.
99. Oloro OH, Obeagu EI. A Systematic Review on Some Coagulation Profile in HIV Infection. *International Journal of Innovative and Applied Research*. 2022;10(5):1-11.
100. Nwosu DC, Obeagu EI, Nkwuocha BC, Nwanna CA, Nwanjo HU, Amadike JN, Eziem MC, Okpomesine EA, Ozims SJ, Agu GC. Alterations in superoxide dismutase, vitamins C and E in HIV infected children in Umuahia, Abia state. *International Journal of Advanced Research in Biological Sciences*. 2015;2(11):268-271.
101. Obeagu EI, Malot S, Obeagu GU, Ugwu OP. HIV resistance in patients with Sickle Cell Anaemia. *Newport International Journal of Scientific and Experimental Sciences (NIJSES)*. 2023;3(2):56-59.
102. Ifeanyi OE, Uzoma OG, Stella EI, Chinedum OK, Abum SC. Vitamin D and insulin resistance in HIV sero positive individuals in Umudike. *Int. J. Curr. Res. Med. Sci*. 2018;4(2):104-108.
103. Ifeanyi OE, Leticia OI, Nwosu D, Chinedum OK. A Review on blood borne viral infections: universal precautions. *Int. J. Adv. Res. Biol. Sci*. 2018;5(6):60-66.
104. Nwovu AI, Ifeanyi OE, Uzoma OG, Nwebonyi NS. Occurrence of Some Blood Borne Viral Infection and Adherence to Universal Precautions among Laboratory Staff in Federal Teaching Hospital Abakaliki Ebonyi State. *Arch Blood Transfus Disord*. 2018;1(2).
105. 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.
106. 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.
107. Obeagu EI, Obeagu GU, Ede MO, Odo EO, Buhari HA. Translation of HIV/AIDS knowledge into behavior change among secondary school adolescents in Uganda: A

**Citation:** Obeagu EI, Obeagu GU. **Maternal Eosinophilic Responses in HIV-Positive Pregnant Women: A Review**. *Elite Journal of Nursing and Health Science*, 2024; 2(1): 32-47

- review. *Medicine (Baltimore)*. 2023;102(49): e36599. doi: 10.1097/MD.00000000000036599. PMID: 38065920; PMCID: PMC10713174.
108. Anyiam AF, Arinze-Anyiam OC, Ironi EA, Obeagu EI. Distribution of ABO and rhesus blood grouping with HIV infection among blood donors in Ekiti State Nigeria. *Medicine (Baltimore)*. 2023;102(47): e36342. doi: 10.1097/MD.00000000000036342. PMID: 38013335; PMCID: PMC10681551.
109. Echefu SN, Udosen JE, Akwiwu EC, Akpotuzor JO, Obeagu EI. Effect of Dolutegravir regimen against other regimens on some hematological parameters, CD4 count and viral load of people living with HIV infection in South Eastern Nigeria. *Medicine (Baltimore)*. 2023;102(47): e35910. doi: 10.1097/MD.00000000000035910. PMID: 38013350; PMCID: PMC10681510.
110. Opeyemi AA, Obeagu EI. Regulations of malaria in children with human immunodeficiency virus infection: A review. *Medicine (Baltimore)*. 2023;102(46): e36166. doi: 10.1097/MD.00000000000036166. PMID: 37986340; PMCID: PMC10659731.
111. Alum EU, Obeagu EI, Ugwu OPC, Samson AO, Adepoju AO, Amusa MO. Inclusion of nutritional counseling and mental health services in HIV/AIDS management: A paradigm shift. *Medicine (Baltimore)*. 2023;102(41): e35673. doi: 10.1097/MD.00000000000035673. PMID: 37832059; PMCID: PMC10578718.
112. Aizaz M, Abbas FA, Abbas A, Tabassum S, Obeagu EI. Alarming rise in HIV cases in Pakistan: Challenges and future recommendations at hand. *Health Sci Rep*. 2023;6(8): e1450. doi: 10.1002/hsr2.1450. PMID: 37520460; PMCID: PMC10375546.