International Journal of Reproduction, Contraception, Obstetrics and Gynecology
Ogoke VI et al. Int J Reprod Contracept Obstet Gynecol. 2023 Mar;12(3):572-576
www.ijrcog.org
pISSN 2320-1770 | eISSN 2320-1789

DOI: https://dx.doi.org/10.18203/2320-1770.ijrcog20230521

Original Research Article

The relationship between psychological stress of female human immune deficiency virus positive serodiscordance and the birthweight of babies delivered by them at the Imo state university teaching hospital Orlu

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Received: 19 December 2022
Revised: 18 February 2023
Accepted: 20 February 2023

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ABSTRACT

Background: The aim of the study was to determine if the emotional distress (stress, and depression) experienced by HIV positive sero-discordant pregnant women because of their retroviral status had any effect on the birth weight of their baby.
Methods: This was a comparative analytical study carried out among HIV positive sero-discordant pregnant women carried out at The Imo State University Teaching Hospital (IMSUTH), Orlu, Imo state, Nigeria, from January 2016 to December 2018. The women were grouped into two groups- A and B. Group A did not experience emotional stress from their husbands because of their serostatus, while group B did. Using the DAS-21 scale (depression, anxiety and stress-21), group B was further sub-classified into mild, moderate and severe emotional distress. After delivery, the birth weights of the babies from the two groups were accordingly recorded.
Results: Out of 322 HIV positive sero-discordant pregnant women recruited for the study, 161 (group A) were supported by their husband, while 161 (group B) were abused and had varying degrees of emotional distress. Emotional distress was significantly more in group B, where 100% of them had varying degrees of emotional distress, while 0% in group A. Similarly, birth weight of babies delivered by group B women were significantly less than that of babies delivered by group A mothers.
Conclusions: There are psychological stress faced by female HIV sero-discordant pregnant women and this is found to be associated with delivering of low birth weight babies by these women.

Keywords: Female HIV sero-discordant, Pregnancy, Emotional distress, Birthweight

INTRODUCTION

Low birth weight is a significant public health problem that new born babies face. Preterm births and low birth weights are the leading causes of infant morbidity and mortality.[1] Apart from immediate problems like increased neonatal admission, respiratory and ear infections, they are associated with both short term and long term morbidity. Long term morbidity includes increased rate of neurological disorders like cerebral palsy, cognitive problems like attention deficits, low intelligence and deficiency of language motor skills, conduct disorders, poor growth attainment, obesity and diabetes mellitus.[2,3]

Human immunodeficiency virus infection is a chronic viral infection with no known cure. It is a condition in which progression of the illness leads to Acquired immuno-deficiency syndrome (AIDS) which is characterized by loss of immunity, infection by life threatening opportunistic infections and allows certain cancer to thrive.[4,5] It contributes to not only 24% of maternal mortality in Sub-Saharan Africa, but also to

maternal emotional trauma in pregnancy which may contribute to poor birth outcomes (low birth weight and preterm delivery) and consequent increase in perinatal morbidity and mortality.[1,6]

A direct relationship between maternal emotional distress and low birth weight may be related to release of catecholamines which results in placental hypoperfusion and consequent restriction of oxygen and nutrients to the fetus leading to intra uterine growth restriction.[7,8]

The human immunodeficiency virus destroys not only the patient's immune system thereby rendering her vulnerable to opportunistic infections, it also destroys the psychological wellbeing of the patient which may have adverse effect on her pregnancy and birth weight. A serodiscordant couple also known as magnetic or mixed status is one in which one partner tests positive to the virus while the other partner tests negative to the virus.[9] It contrasts with seroconcordant in which both partners are of the same HIV status.

In the Sub-Saharan Africa, the prevalence of female serodiscordance is about 60% among married/ cohabiting couples.[6] The HIV positive pregnant patient is saddled with not only the problem of the stress associated with the pregnancy but also with the psychological and pathological distress associated with the HIV infection. The HIV serodiscordant pregnant woman may also be subjected to negative psychological distress due to the husband's reaction to the serodiscordancy.[10,11] There may be questions pertaining to paternity of the unborn child and marital fidelity, which may translate to anger, violence and economic deprivation.[12-15]

It has been shown that negative psychological impact as a result of the husband's hostility may include stress, anxiety disorder, depression, substance abuse, alcoholism, use of tobacco, feeling of worthlessness, and sleep disorder.[16-20] Others are change in appetite, weight loss, preeclampsia, non-adherence to medications, default in attending antenatal clinic and suicidal tendencies.[21,22] These can significantly interfere with the woman's ability to care for herself, including participating in optimal prenatal care and also maintaining appropriate diet.[23]

These will consequently be associated with adverse pregnancy outcome and decrease use of pediatrics care after birth.[24,25]

The fetus apart from having the risk of antepartum, intrapartum and postpartum HIV transmission, is also faced with complications like increased intrauterine artery resistance, intrauterine growth restriction, preterm delivery, change in fetal haemodynamic and altered autonomic reactivity.[26]

Many research studies had focused on different areas of HIV and AIDS, but few have been done on the possible effect of psychological due to HIV positive sero-discordancy on the birthweight of babies delivered by these women, thus the justification for this study.

METHODS

Study type

This was a comparative analytical.

Study place

The study was carried out at the Imo State University Teaching Hospital (IMSUTH), Orlu, Imo state, Nigeria, from January 2016 to December 2018.

Selection criteria

Consenting married HIV positive sero-discordant when carrying uncomplicated singleton pregnancy, and those who had absence of any medical disease in pregnancy were selected.

Procedure

After obtaining approval of the ethical committee of the hospital and obtaining consent from confirmed HIV positive sero-discordant pregnant women, they were recruited from the antenatal clinic of the hospital.

The women were followed until their third trimester of pregnancy when the questionnaire below were administered to them. The participation in the study was purely voluntary and all information in the questionnaire were treated confidentially. Based on the women's response to question number 15, they were divided into groups A and B. Group A was for HIV positive serodiscordant pregnant women whose husbands did not abuse because of their HIV serodiscordance and thus do not suffer emotional distress because of their serodiscordance, and group B is for HIV positive serodiscordiscordant pregnant women whose husbands abuse because of their serodiscordance and thus have emotional distress because of the abuse.

Diagnosis and classification of the patients further into mild, moderate and severe emotional distress was made based on their response to the Depression, anxiety, stress scale (DASS-21) questionnaire below which was administered and interpreted by a psychologist recruited for the study during the third trimester. The DASS-21 is a 21-item self-report instrument designed to measure the three related negative emotional states of depression, anxiety and tension/stress. Then, after delivery of these women, the birthweight of the babies in kg were recorded.

Ethical approval

After getting informed consent from the pregnant women for the study, ethical approval was gotten from the research and ethics committee of the hospital

Statistical analysis

The data was analyzed using statistical package for social sciences (SPSS). The mean and standard deviation were determined for each group and statistical relationship between the two groups was explored using the paired t test and a p value of less than 0.05 at 95% confidence interval was considered statistically significant. To minimize error due to confounding factors patients with similar characteristics were chosen for the study.

RESULTS

Out of the 322 HIV positive serodiscordant pregnant women that participated in the study, 161 had the support of their husband despite their serodiscordance and thus did not have emotional distress in pregnancy because of their serodiscordance and were in group A. The other 161 HIV positive serodiscordant women who had varying degrees of emotional distress as a result of their husband's hostility because of their serodiscordance were in group B.

In group B, 100% of the women suffered different degrees of emotional distress with 54.7% (88/161) being mildly emotionally distress, 34.8% (56/161) moderately emotionally distressed, and 10.6% (17/161) being severely emotionally distressed. Comparatively, group A women were significantly (p=0.001) less likely to suffer emotional distress as none (0%) of the women were emotionally distressed (Table 1).

Table 1: Distribution of patients based on their response to the DASS questionnaire.

Group A N (%)	Group B N (%)		
	Mild	Moderate	Severe
0 (0)	88 (54.7)	56 (34.8)	17 (10.6)

The maternal weight of the women in kg ranged from 45-79.5 kg. 24.8% (40/161) of the women in group A fell within the bodyweight group of 65-69.9 kg, while 41% (66/161) of the women in group B fell within 55-59.9 kg bodyweight group (Table 2).

Table 2: Weight distribution (kg) of women in both groups.

Maternal weight (kg)	Group A	Group B
45.0-49.9	7	25
50.0-54.9	20	45
55.0-59.9	30	66
60.0-64.9	35	10
65.0-69.9	40	10
70.0-74.9	20	3
75.0-79.9	9	2

The parity of the women ranged from para 1- para 8. Para 3 contributed the highest percentage 31.1% (50/161) in group A, while in group B, Para 2 contributed the highest percentage of 41.6% (67/161).

The mean birthweight of babies in group B 3.1 kg and was statistically lower than that of group A that was 3.3 kg (p=0.001) (Table 3).

Table 3: Distribution of birth weights (kg) in group A and group B.

Maternal weight (kg)	Group A	Group B
≤2.49	18	23
2.50-2.99	33	65
3.00-3.49	56	36
3.50-3.99	38	21
4.00-4.49	13	11
≥4.50	3	5

Table 4 below shows that low birthweight babies (≤2.49 kg) were more likely to be delivered by severely emotionally distressed mothers, as 17.1% (7/41) of the babies ≤2.49 kg were delivered by severely emotionally distressed women. This is contrary to only 1.7% (1/59) of babies weighing 3.50-3.99 kg were delivered by the same group of women, and no baby ≥4.50 kg was delivered by severely emotionally distressed women.

Table 4: Relationship between birth weight and degree of distress.

Birth weight (kg)	Group A	Mild distress	Mode-rate distress	Severe distress
≤2.49	18	9	7	7
2.50-2.99	33	36	24	5
3.00-3.49	56	21	11	4
3.50-3.99	38	12	8	1
4.00-4.49	13	8	3	Nil
≥4.50	3	2	3	Nil

DISCUSSION

Pregnancy is supposed to be one of the happiest moments of a woman's life resulting to the delivery of a healthy baby. But for the HIV positive serodiscordant pregnant woman with abusive husband, the fear, stress, anxiety and even depression that is associated with the pregnancy and serodiscordance impacts negatively on the birth weight of her baby. In this study, it was discovered that newborns whose mothers suffered severe emotional distress in pregnancy because of abuse by their husband due to their serodiscordance had lower birth weights when compared to the newborns whose mothers were not exposed to prenatal stress and this is consistent with several studies.[8,28-31] This was contrary to other studies which found no association between maternal stress and birth weight.[32,33] Furthermore, there was a strong negative effect on birth weight of the neonates whose mothers were in the

group with severe emotional distress compared to babies delivered of mothers without any experience of emotional distress because of abuse by their partners due to their serodiscordance in their pregnancy, and whose birthweights were almost compatible to the neonates delivered by HIV negative mothers. Recent well controlled studies have documented that high levels of anxiety and depression in the prenatal period resulted in reduced birth weight and smaller head size. This effect of prenatal stress is of the same magnitude as the effect of smoking.[34] Similarly, Diego et al showed a relationship between maternal psychological distress (anxiety, depression and daily hassles) and low fetal birth weight.[35] This effect of maternal stress on fetal weight is believed to be mediated in part by the maternal hypothalamo-pituitary axis. Cortisol from the mother is transported through the placenta to the fetus and triggers dysfunction of the fetal neuroendocrine system which ultimately contributes to low birth weight.[35-37]

Limitation

The major limitation of the study was that it was a referral/teaching hospital- based study and thus may not be a perfect reflection of the whole society.

CONCLUSION

There are psychological stress faced by female HIV serodiscordant pregnant women and this is found to be associated with delivering of low birth weight babies by these women. With this knowledge, spouses in an HIV serodiscordant relationship could be better informed and counselled on the need to avoid abusive relationships especially while the partner is pregnant.

ACKNOWLEGEMENTS

We wish to acknowledge the contributions of all the staff in the Department of Obstetrics and Gynaecology of Imo State University Teaching Hospital, Orlu in making this research project a success. We also thank the Laboratory Scientist for his contributions.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Ethical and Research Committee Imo State University Teaching Hospital, Orlu

REFERENCES

1. WHO. Expert Committee on Physical Status: the Use and Interpretation of Anthropometry (1993: Geneva, Switzerland) and WHO. (1995). Physical status: the use of and interpretation of anthropometry, report of a WHO expert committee, 2021. Available at: https://apps.who.int/iris/handle/10665/37. Accessed on 10 December 2022.
2. Mathew TJ, Menacker F, MacDorman MF. Infant mortality statistics from the 2001 period linked birth/infant death data. 2003: Natural vital statistics Report. 2003;52:1-27.
3. Hack M, Klein NK, Taylor HG. Long-term developmental outcomes of low birth weight infants. Future Child. 1995;5(1):176-96.
4. Weiss RA. How does HIV cause AIDS? Science. 1993;260(5112):1273-9.
5. Douek DC, Roederer M, Koup RA. Emerging concepts in the immunopathogenesis of AIDS. Annu Rev Med. 2009;60:471-84.
6. Siriwasin W, Shaffer N, Roongpisuthipong A, Bhiraleus P, Chinayon P, Wasi C, et al. HIV prevalence, risk, and partner serodiscordance among pregnant women in Bangkok. Bangkok Collaborative Perinatal HIV Transmission Study Group. JAMA. 1998;280(1):49-54.
7. Omer H. Possible psychophysiologic mechanisms in premature labor. Psychosomatics. 1986;27(8):580-4.
8. McAnarney ER, Stevens-Simon C. Maternal psychological stress/depression and low birth weight. Is there a relationship? Am J Dis Child. 1990;144(7):789-92.
9. Carpenter LM, Kamali A, Ruberantwari A, Malamba SS, Whitworth JA. Rates of HIV-1 transmission within marriage in rural Uganda in relation to the HIV sero-status of the partners. AIDS. 1999;13(9):1083-9.
10. Njau B, Watt MH, Ostermann J, Manongi R, Sikkema KJ. Perceived acceptability of home-based couples voluntary HIV counseling and testing in Northern Tanzania. AIDS Care. 2012;24(4):413-9.
11. Gliemann J, Desgrées-Du-Loû A. The involvement of men within prenatal HIV counselling and testing. Facts, constraints and hopes. AIDS. 2008;22(18):2555-7.
12. KNBS. Kenyan demographic and health survey 2008-09, 2010. Available at: https://dhsprogram.com/pubs/pdf/fr229/. Accessed on 10 December 2022.
13. Medley A, Garcia-Moreno C, McGill S, Maman S. Rates, barriers and outcomes of HIV serostatus disclosure among women in developing countries: implications for prevention of mother-to-child transmission programmes. Bull World Health Organ. 2004;82(4):299-307.
14. Akani CI, Erhabor O. Rate, pattern and barriers of HIV serostatus disclosure in a resource-limited setting in the Niger delta of Nigeria. Trop Doct. 2006;36(2):87-9.
15. Chandra PS, Deepthivarma S, Manjula V. Disclosure of HIV infection in south India: patterns, reasons and reactions. AIDS Care. 2003;15(2):207-15.
16. Eller LS, Bunch EH, Wantland DJ, Portillo CJ, Reynolds NR, Nokes KM, et al. Prevalence, correlates, and self-management of HIV-related depressive symptoms. AIDS Care. 2010;22(9):1159-70.

17. Kagee A, Martin L. Symptoms of depression and anxiety among a sample of South African patients living with HIV. AIDS Care. 2010;22(2):159-65.
18. Lazarus R, Struthers H, Violari A. Hopes, fears, knowledge and misunderstandings: responses of HIV-positive mothers to early knowledge of the status of their baby. AIDS Care. 2009;21(3):329-34.
19. Mello VA, Segurado AA, Malbergier A. Depression in women living with HIV: clinical and psychosocial correlates. Arch Womens Ment Health. 2010;13(3):193-9.
20. Olley BO. Psychological distress in the first year after diagnosis of HIV infection among women in South Africa. Afr J AIDS Res. 2006;5(3):207-15.
21. Kwalombota M. The effect of pregnancy in HIV-infected women. AIDS Care. 2002;14(3):431-3.
22. Do NT, Phiri K, Bussmann H, Gaolathe T, Marlink RG, Wester CW. Psychosocial factors affecting medication adherence among HIV-1 infected adults receiving combination antiretroviral therapy (cART) in Botswana. AIDS Res Hum Retroviruses. 2010;26(6):685-91.
23. Bhatia R, Hartman C, Kallen MA, Graham J, Giordano TP. Persons newly diagnosed with HIV infection are at high risk for depression and poor linkage to care: results from the Steps Study. AIDS Behav. 2011;15(6):1161-70.
24. Alder J, Fink N, Bitzer J, Hösli I, Holzgreve W. Depression and anxiety during pregnancy: a risk factor for obstetric, fetal and neonatal outcome? A critical review of the literature. J Matern Fetal Neonatal Med. 2007;20(3):189-209.
25. Marchesi C, Bertoni S, Maggini C. Major and minor depression in pregnancy. Obstet Gynecol. 2009;113(6):1292-8.
26. Roger FH. Psychiatric illness in: High risk pregnancy, management options, James, Steer, Weiner, Gonik, Crowther. 4th ed. New York, NY: Elsevier Saunders; 2011: 997-1009.
27. Lovibond SH, Lovibond PF. Manual for the Depression Anxiety & Stress Scales. 2nd ed. Sydney: Psychology Foundation; 1995.
28. Bailey BA, Byrom AR. Factors predicting birth weight in a low-risk sample: the role of modifiable pregnancy health behaviors. Matern Child Health J. 2007;11(2):173-9.
29. Rahman A, Bunn J, Lovel H, Creed F. Association between antenatal depression and low birthweight in a developing country. Acta Psychiatr Scand. 2007;115(6):481-6.
30. American College of Obstetricians and Gynecologists Committee on Health Care for Undeserved Women. ACOG Committee Opinion No. 343: psychosocial risk factors: perinatal screening and intervention. Obstet Gynecol. 2006;108(2):469-77.
31. Henrichs J, Schenk JJ, Roza SJ, Berg MP, Schmidt HG, Steegers EA, et al. Maternal psychological distress and fetal growth trajectories: the Generation R Study. Psychol Med. 2010;40(4):633-43.
32. Pagel MD, Smilkstein G, Regen H, Montano D. Psychosocial influences on new born outcomes: a controlled prospective study. Soc Sci Med. 1990;30(5):597-604.
33. Peacock JL, Bland JM, Anderson HR. Preterm delivery: effects of socioeconomic factors, psychological stress, smoking, alcohol, and caffeine. BMJ. 1995;311(7004):531-5.
34. Lou HC, Hansen D, Nordentoft M, Pryds O, Jensen F, Nim J, et al. Prenatal stressors of human life affect fetal brain development. Dev Med Child Neurol. 1994;36(9):826-32.
35. Diego MA, Jones NA, Field T, Hernandez-Reif M, Schanberg S, Kuhn C, et al. Maternal psychological distress, prenatal cortisol, and fetal weight. Psychosom Med. 2006;68(5):747-53.
36. Sandman CA, Glynn L, Schetter CD, Wadhwa P, Garite T, Chicz-DeMet A, et al. Elevated maternal cortisol early in pregnancy predicts third trimester levels of placental corticotropin releasing hormone (CRH): priming the placental clock. Peptides. 2006;27(6):1457-63.
37. Petraglia F, Calzà L, Garuti GC, Giardino L, De Ramundo BM, Angioni S. New aspects of placental endocrinology. J Endocrinol Invest. 1990;13(4):353-71.

Cite this article as: Ogoke VI, Okeudo C. The relationship between psychological stress of female human immune deficiency virus positive serodiscordance and the birthweight of babies delivered by them at the Imo state university teaching hospital Orlu. Int J Reprod Contracept Obstet Gynecol 2023;12:572-6.