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Original Research Article

Assessing risk factors for overweight among people living with HIV transitioning to post-dolutegravir-based regimens in Homa Bay County, Kenya

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ABSTRACT

Background: Viral suppression and treatment outcomes have significantly improved for people living with HIV (PLHIV) on Dolutegravir (DTG)-based regimens. More recently, however, there has been evidence that DTGs are associated with weight gain and therefore overweight and obesity, and the associated non-communicable diseases. The aim of this study was to evaluate risk factors for overweight in PLHIV transitioned onto DTG-based regimens in Homa Bay County in Kenya.
Methods: A mixed-methods study that combined retrospective cohort and cross-sectional approach was used on PLHIV aged ≥18 years receiving DTG-based regimens for ≥6 months in 7 public health facilities in Homa Bay county. Data was collected on 540 people (90% response rate) using medical record review, structured questionnaires and a food frequency questionnaire. SPSS 27 was used to perform descriptive statistics, chi-square tests, Pearson's correlation, t test, and multivariate regression.
Results: The results indicated that 4.2 kg weight gain occurred after transition to the DTG-based regimens. There was more weight gain in female participants than in male. Socio-demographic characteristics (χ^2=18.6, p=0.005; r=0.41, p=0.01), dietary factors (r=0.47, p<0.001) and medication adherence (r=0.41, p=0.01) were significantly associated with weight gain.
Conclusions: Socio-demographic factors, dietary patterns and treatment adherence significantly influenced weight gain in PLHIV on DTG-based treatment. Clinically embedding chronic disease monitoring, nutrition counseling and non-communicable disease testing into HIV care could help manage downstream health implications.

Keywords: Dolutegravir, ART, Weight gain, Overweight, People living with HIV, Non-communicable diseases

INTRODUCTION

Although there have been significant advances in HIV prevention and treatment, HIV is still a significant global public health problem. In 2022, an estimated 39 million people worldwide lived with HIV, of which close to two-thirds (23 million) were in sub-Saharan Africa.[1] Kenya continues to be one of the countries with high HIV prevalence and Homa Bay County has had one of the highest HIV prevalence rates in the country.[2] ART has been scaled up and HIV infection is now a treatable chronic illness with increased survival and quality of life for PLHIV.

DTG-based regimens are currently the first-line ART of choice in recent years for their potent activity against HIV, high genetic barrier to resistance, good tolerability, and high viral suppression rates.[3] Many countries, including Kenya, changed the antiretroviral therapy of PLHIV from previous ART to DTG therapy, a recommendation by the World Health Organization.[4] This

shift has made a big difference to the effectiveness of treatment and helped reach UNAIDS 95-95-95 targets.

The advantages of DTG-based regimens do not outnumber the disadvantages, however, since there is significant weight gain seen with DTG-based regimens among PLHIV.[5] In South America and Sub-Saharan Africa, several studies have reported overweight and obesity incidence rates for people on DTG therapy to be higher than those on non-DTG therapy.[6] Excessive weight gain is a major problem as it can lead to obesity and other NCDs such as hypertension, diabetes mellitus, and cardiovascular diseases.[7] This means that the HIV and NCD dual burden adds an extra burden to the health care systems, especially in resource-limited contexts.

Several factors have been previously associated with weight gain in PLHIV taking DTG regimens: sex, age, baseline BMI, dietary habits, physical activity and adherence to the regimen. Weight gain after initiation or switch to DTG has been linked to female sex and to older age.[8,9] Poor level of adherence to ART and diet have also been suggested as significant factors influencing changes in body weight in PLHIV.[10,11] Evidence, however, is mixed among studies and situational factors may affect the amount and factors associated with weight gain.

While evidence of DTG associated weight gain is growing around the world, little information is available on factors associated with overweight in PLHIV after transition to DTG based regimens in Kenya specifically in Homa Bay County. In addition, the role of socio-demographic, dietary and adherence to treatment factors on overweight among PLHIV in this context has still not been well described. These factors are critical to guiding interventions to prevent excessive weight gain and decrease risks of NCDs for PLHIV.

Hence, the purpose of this study was to evaluate the socio-demographic, dietary and treatment-related risk factors for overweight in PLHIV post-transition to DTG-based regimens in Homa Bay County, Kenya.

METHODS

Study design

To evaluate risk factors for overweight among PLHIV after switching to DTG-based regimens, a mixed-method study combining retrospective cohort and cross-sectional designs were performed.[12] The retrospective cohort used existing medical records to ascertain weight change post-transition to DTG-based regimens and the cross-sectional component allowed for evaluation of socio-demographic, dietary characteristics and adherence to treatment.

Study setting

The research was carried out in Homa Bay County, Kenya, from October 2025 to March 2026. Homa Bay County was among areas with the highest HIV prevalence rates in Kenya and was one of the counties that was part of the national rollout of DTG-based regimens.[13] Seven public health facilities that have been in operation and running their HIV care programs were purposively selected to implement EMRs. These were Homa Bay County Teaching and Referral Hospital, Rachuonyo Sub-County Hospital, Mbita Sub-County Hospital, Ndhiwa Sub-County Hospital, Marindi Sub-County Hospital, Rangwe Sub-County Hospital, and Kendu Sub-County Hospital.

Study population

The study used the following inclusion criteria: PLHIV aged 18 years old and above; PLHIV on DTG-based regimen for at least six months; and PLHIV who had their baseline and follow-up weight recorded. The selected facilities were used for recruiting participants. The study used the following exclusion criteria: pregnant women, patients with malignancies and nutritional supplementation, and patients with incomplete medical records. The target population was 15,491 PLHIV who had been on DTG based regimens in Homa Bay County.

Sample size and sampling procedure

A sample size of 600 participants was selected based on the margin of error of 4% and 95% confidence level in the population proportion formula. 540 of the respondents (90% response rate) completed the full survey. Medical records were sampled systematically for the retrospective cohort analysis and simple random sampling was used to sample for the cross-sectional survey. Records were sampled every 26.

Data collection

The study collected primary and secondary data using structured questionnaires and medical records respectively. Primary data pertaining socio-demographic factors, educational status, profession, adherence to prescribed treatment and food habits were obtained by means of structured questionnaires. Food Frequency questionnaire was used to collect dietary intake data, based on a survey instrument from Kenya National Nutrition Survey. Additionally, data collected from medical records were age, sex, date of transitioning to DTG-based regimens, clinic visits, and weight. Baseline and follow-up body weights were used to measure weight gain, collected within 6-12 months of starting DTG-based regimens. Clinically significant weight gain was defined as a ≥5% increase from baseline body weight.

Study variables

Overweight after transition to DTG-based regimens was the dependent variable. Socio-demographic, dietary and adherence to DTG-based regimens were independent variables. Analysis was adjusted for potential

confounders including baseline BMI, co-medications and comorbidities.

Statistical analysis

Data was entered, cleaned and analyzed using SPSS 27. Participant characteristics and weight changes were summarized using descriptive statistics. Means and standard deviations were used for continuous variables, whereas frequencies and percentages were used for categorical variables. Chi-square tests were used to evaluate the relationship between categories of weight gain and dietary factors. Pearson's correlation analysis was used to explore relationships between continuous dietary variables and weight gain. Independent t-test was used to compare the mean weight gain between adherence groups. Baseline BMI, baseline comorbidities and baseline co-medications were adjusted using multivariate regression analysis. A $p<0.05$ was considered to be statistically significant.

Ethical considerations

Ethical clearance of the study was obtained from Maseno University Ethics Review Committee (MUERC), while permission for its implementation was granted by the Homa Bay County Department of Health and health facilities involved in the study. All participants provided their informed consent in writing before data collection. Participants' information was anonymized and data collected for the study was only made available to the research team, ensuring confidentiality and privacy.

RESULTS

Participant characteristics

A total of 600 participants were targeted for the study, of whom 540 provided complete data, resulting in a response rate of 90%. The majority of participants were female (55.9%), while male constituted 44.1% of the study population. More than half of the respondents (53.9%) were aged between 18 and 29 years, followed by those aged 30-39 years (28.0%) and those aged 40 years and above (18.1%). Married participants accounted for 53.7% of the study population.

Weight gain following transition to DTG-based regimens

Participants experienced an average weight gain of 4.2 kg following transition to DTG-based regimens. The median weight gain was 4.0 kg, while the modal weight gain was 3.5 kg, indicating that weight gain was common among the study population.

Female participants experienced higher average weight gain compared with male participants. Weight gain was also observed across all age groups, with variations according to socio-demographic characteristics.

Table 1: Socio-demographic characteristics of participants (n=540).

Characteristics	N	Percentage (%)
Sex		
Male	238	44.1
Female	302	55.9
Age group (in years)		
18-29	291	53.9
30-39	151	28.0
≥40	98	18.1
Marital status		
Single	77	14.3
Married	290	53.7
Other	173	32.0

Table 2: Summary statistics for weight gain following transition to DTG-based regimens.

Statistics	Weight gain (kg)
Mean	4.2
Median	4.0
Mode	3.5

Dietary factors associated with weight gain

Dietary factors were significantly associated with weight gain among participants. Chi-square analysis demonstrated a statistically significant association between dietary patterns and weight gain categories ($\chi^2=18.6$, df=6, $p=0.005$).

Pearson's correlation analysis showed a moderate positive relationship between dietary intake scores and weight gain ($r=0.41$, $p=0.01$), suggesting that higher dietary intake scores were associated with the greater weight gain.

Table 3: Association between dietary factors and weight gain.

Statistical test	Value
Chi-square (χ^2)	18.6
Degrees of freedom	6
p value	0.005
Pearson correlation coefficient (r)	0.41
Correlation p value	0.01

Association between adherence to DTG-based regimens and weight gain

Participants with optimal adherence to DTG-based regimens experienced significantly greater weight gain compared with those with suboptimal adherence. The mean weight gain among participants with optimal adherence was 4.60±2.66 kg, whereas participants with suboptimal adherence had a mean weight gain of 3.50±2.66 kg. The mean difference of 1.10 kg was statistically significant ($t=4.82$, df=538, $p<0.001$).

Further analysis revealed a moderate positive correlation between adherence scores and weight gain (r=0.47, p<0.001), indicating that increased adherence to DTG-based regimens was associated with the higher weight gain.

Table 4: Relationship between adherence and weight gain.

Variables	Value
Mean weight gain among optimal adherence group (kg)	4.60
Mean weight gain among suboptimal adherence group (kg)	3.50
Mean difference (kg)	1.10
T statistic	4.82
Degrees of freedom	538
P value	<0.001
Pearson correlation coefficient (r)	0.47
Correlation p value	<0.001

Multivariate analysis

Multivariate regression analysis was performed to control for potential confounding variables including baseline BMI, comorbidities, and co-medications. The analysis demonstrated that socio-demographic characteristics, dietary factors, and medication adherence remained important predictors of weight gain following transition to DTG-based regimens.

DISCUSSION

In the present study, the risk factors for overweight status among PLHIV after transitioning to DTG-based regimen in Homa Bay County Kenya were assessed. The results proved that there was a mean weight gain of 4.2 kg after the transition of participants to the DTG-based therapy. Among PLHIV taking DTG-based regimens, socio-demographic, dietary characteristics, and medication adherence were significantly associated with the weight gain.

The weight gain after transition to DTG-based regimens detected in this study is similar to that observed in previous studies in South America and sub-Saharan Africa, which have found weight gain among PLHIV on DTG-based regimens.[14] This has been reported in other studies performed in South Africa, and Uganda, which found that treatment with DTG led to higher weight gains.[15] The increased virological effectiveness of DTG and health status after viral suppression might account for the weight gain observed.

There was greater weight gain in the female participants compared with male, consistent with previous studies which showed female participants to be more susceptible to weight gain associated with DTG. Sex differences have been proposed to be explained by biological differences, hormonal influences, and differences in body fat distribution. Women are also likely to be at risk of weight gain in many African contexts due to their diet and lifestyle.

Weight gain was found to be significantly related to dietary factors, with the test scores showing a medium positive correlation with weight gain. This study indicates that nutrition is a significant factor in the body weight of PLHIV on DTG-based therapy. The findings have been replicated in other studies that have shown that higher caloric intake and the diversity of foods can lead to weight gain in people taking antiretroviral treatment.[16] Although better nutrition status is associated with improved outcomes of treatment, excessive caloric intake increases the risks of overweight and obesity.

Adherence to medication was positively related to weight gain. Those who adhered to the interventions gained significantly more weight than those who adhered sub-optimally. This is in line with other research showing that adherence to ART and successful viral suppression and immune recovery can restore appetite and trigger weight gain.[17] While treatment adherence is important for optimal treatment outcomes, there is a risk of weight gain that might lead to overweight and NCDs.[18]

The findings of this study have important public health implications. HIV care programmes should routinely check weights, provide nutritional counselling, and screen for obesity-related NCDs in the growing context of DTG-based regimens. Combined HIV and NCD management strategies can support better long-term health for PLHIV. Identifying persons who are at high risk of overweight at an early stage would help to implement interventions at an appropriate time to prevent obesity and its consequences.

This study benefited from mixed-method design that involved both retrospective cohort and cross-sectional methods, allowing for a comprehensive assessment of factors associated with weight gain. In addition, involvement of participants from seven public health facilities increased the representativeness of the results. The study was however, not without its weaknesses. Retrospective design might have caused information bias due to incomplete medical records. The dietary information was self-reported, and thus potentially subject to recall error. Further, the cross-sectional design did not allow for assessing causal relationships between the factors identified and weight gain.

Regardless of these limitations, the study offers contextual evidence for factors associated with overweight among PLHIV post-transition to DTG-based regimens. The results add to the existing evidence of DTG-related weight gain and highlight the importance of HIV care strategies that incorporate management of both infectious and risk NCDs risk factors.

CONCLUSION

The results of this study showed that socio-demographic factors, dietary habits and adherence to medication are significant factors that affect weight gain in individuals with HIV after transitioning to DTG-based regimens. The mean weight gain was 4.2 kg, with female participants showing more weight gain than male. Increased weight gain was positively associated with dietary practices and optimal adherence to DTG-based therapy, which continues to be an effective treatment to achieve viral suppression and treatment success, but can lead to weight gain, raising the risk of overweight, obesity and non-communicable diseases. The results highlight the importance of multi-sectoral approach to HIV care and prevention of NCDs for PLHIV.

Recommendations

HIV care programmes should routinely consider monitoring weight, to enable prompt identification and management of excess weight gain among PLHIV on DTG-based treatment. Nutritional counselling and lifestyle modification interventions should be enhanced to encourage healthy eating habits and to prevent overweight and obesity. Purposeful screening for NCDs should be included as part of the standard HIV care to enhance long-term health of people with HIV. Long-term follow-up is suggested to establish causal relationships and to assess long-term consequences of weight gain among PLHIV on DTG-based therapy.

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