**ASSESSING THE IMPACT OF AGRICULTURE ON FOOD SECURITY, NUTRITION, AND HIV OUTCOMES IN SENEGAL, WEST AFRICA**

**Introduction**

- Based on our prior work in Senegal, as many as 68% of people living with HIV (PLHIV) are severely food insecure and nearly a quarter are undernourished.
- Severe food insecurity is associated with loss to follow-up, virologic failure, and poor adherence to antiretroviral therapy (ART), while poor nutritional status is associated with poor immunologic recovery, virologic failure, and death.
- Multisectoral agricultural interventions have the potential to improve food security, nutritional status, and HIV outcomes. In order to develop and implement effective, evidence-based interventions, an understanding of the associations between the practice of agriculture and food security, nutritional status, and HIV outcomes is needed.

**Methods**

- HIV-positive individuals presenting for initiation of ART through the Senegalese National AIDS program were enrolled and followed for 12 months.
- Participants were enrolled in Dakar, the country’s capital, and in Ziguinchor, located in the Casamance Region. The Casamance recently emerged from a decades long war for independence. The longstanding civil conflict, which involved the extensive use of landmines, disrupted the traditional, agriculture-based economy.
- Data were collected using semi-structured interviews, clinical evaluations, laboratory analyses, and chart review.
- Food insecurity was determined using the Household Food Insecurity Access Scale. Dietary Diversity was determined using the Household Dietary Diversity Score. Nutritional status was determined using body mass index (BMI).
- HIV-1 and HIV-2 plasma RNA viral loads were measured using RealTime HIV-1 and HIV-2 Abbott m2000 platform assays. Adherence was determined by participant report.
- Descriptive analysis was performed for all variables. Chi-square tests and Fisher’s Exact tests were used to identify differences in outcomes between individuals who practice agriculture versus those who do not practice agriculture. Logistic regression was used to determine the association between the practice of agriculture and HIV outcomes.

**Findings and Interpretations**

- Among 193 participants, 45 (23%) practiced agriculture; 32% of participants in Ziguinchor practiced agriculture versus 11% in Dakar (p<0.01). The majority of participants (70%) were women.
- At enrollment, individuals who practiced agriculture were less likely to be food secure (11.1% versus 35.4%) and more likely to be severely food insecure (46.7% versus 23.8%) compared to those who did not practice agriculture (p<0.01). Median daily food expenditure was lower among those who practiced agriculture ($2.39 versus $4.35, p<0.01).
- Following 12 months of ART, individuals who practiced agriculture were more likely to be severely food insecure (50.0% versus 17.2%, p<0.01).
- Those who practiced agriculture were more likely to report poor adherence to ART (28.6% versus 5.7%, p=0.01) and were more likely to experience virologic failure (32.0% versus 10.0%, p=0.02).
- In the multivariable analysis, the practice of agriculture was predictive of poor adherence to ART (OR 10.79 [1.84-63.36]) and virologic failure (OR 9.99 [2.33-42.85]).
- There was no difference in dietary diversity score, median BMI, undernutrition, median hemoglobin, or CD4 cell count at enrollment or M12, and no difference in WHO stage 3/4 disease or time to initiation of ART, among those who practiced agriculture compared to those who did not practice agriculture.

**Conclusions**

- Individuals who practiced agriculture were more likely to be severely food insecure, report poor adherence to ART, and experience virologic failure.
- Conflicting demands on time may contribute to the association between the practice of agriculture and poor HIV outcomes, as individuals may prioritize time spent on agricultural work responsibilities rather than traveling to clinic or returning home to take their ART.
- Our findings suggest that HIV-positive individuals who practice agriculture may be an especially vulnerable population in Senegal.
- Based on our findings, it is recommended that multisectoral agricultural interventions targeting PLHIV incorporate strategies to promote and support adherence to ART.

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