

論文の内容の要旨

論文題目 Adherence to Antiretroviral Treatment (ART) among HIV Positive Orphans and Non-orphans
in Kigali, Rwanda

(ルワンダ国キガリ市の HIV 陽性遺児および非遺児における抗レトロウイルス療法
(ART) の服薬アドヒアランス)

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Background: Worldwide, the AIDS epidemic puts children at grave risk. The Millennium Development Goals called for stop spreading HIV/AIDS by 2015, but progress is not as fast as expected. In particular, HIV infection has severely hit Sub-Saharan African countries, where the number of HIV positive children represents 90% of all HIV infected children in the world. Furthermore, HIV infection among orphaned children constitutes an important issue in Africa. Orphans are ostracized from familial and/or social support, and they are considered to have greater barriers for their care and treatment.

To reduce children's HIV/AIDS-related mortality and progression, high levels of ART adherence is critical. Many studies have been conducted to identify factors related to ART adherence among HIV positive children, but only a few studies have been done about the relationship between orphan statuses and ART adherence in the resource limited settings. Even among those limited studies, their results were not consistent, and the relation between ART adherence and the different orphan statuses (single orphan, double orphan, and non-orphan) gained less paid attention. However social context of children and caregivers varies depending on their orphan status and this could impact on children's ART adherence differently. Nevertheless, in most adherence studies, orphan status was usually only classified as 'orphan' or 'non-orphan'.

Rwanda is one of the countries which have been suffering from the HIV/AIDS crisis for a longtime. The Rwandan genocide considerably influenced the risk of HIV infection, where thousands of survivors affected the virus as a result of systematic sexual violence. Although Rwanda has experienced drastic decline in the HIV prevalence rate after the genocide, HIV/AIDS has given still enormous impact on this

country's health issues. Furthermore, HIV positive orphans are also key priorities in its national HIV/AIDS response. This is because Rwanda has seen an increase in orphans because of both the death of parent(s) due to the HIV/AIDS and the genocide, and considerable number of them is estimated to be HIV positive through the vertical infection from mother to child. They are considered to be in vulnerable circumstances such as lower health status and lower nutritional status, as well as poor ART adherence. However, ART adherence has been paid less attention among HIV positive pediatric population, including orphans and non-orphans in Rwanda.

Objective: I aimed to identify whether different orphan status (single orphan, double orphan, and non-orphan) was associated with adherence to ART. I also investigated determinants of the adherence to ART and the ART related characteristics among HIV positive children in Kigali, Rwanda.

Methods: I conducted a cross-sectional study combined with a qualitative study. Two studies, quantitative and qualitative, were combined to enrich further the findings than conducting one study. I combined two studies following the "follow-up explanations model" of Creswell. I conducted the quantitative phase between March and May 2011 at 15 selected health facilities in Kigali. In total, 717 HIV positive children and their caregivers were participated. Out of the total, single orphan, double orphan, and non-orphan were 258 (36.0%), 113 (15.8%), and 346 (48.3%), respectively. The investigators counted remaining pill of the HIV positive children, conducted the primary caregivers' interviews, measured the children's growth status, and collected clinical records of children currently enrolled in ART programs. A child was defined to be adherent if s/he took 85% or more of the monthly prescribed doses. For data analysis, I carried out descriptive analysis for each orphan status to explore all variables of the children and the caregivers. I used Chi-square test for nominal scale variables. ANOVA was used for parametric interval or ratio scale variables, and Kruskal-Wallis test was used for nonparametric interval or ratio scale variables. To explore associations between the exposure variables and ART non-adherence, I carried out a multivariate logistic regression analysis with $p < 0.05$. Data entry and analyses were executed using SPSS version 18.0.

I conducted the qualitative study from June to November 2011 in Kigali. In total, 121 caregivers participated in 19 FGD. FGD groups were made according to orphan status and ART adherence/non-adherence status of the caregiving child. Of all caregivers, caregivers of non-orphans, single paternal-orphans, single maternal-orphans, and double orphans were 38.0%, 27.3%, 15.7%, and 19.0%, respectively. I analyzed contents of all discussions by 'five-phased cycle' of Yin, compiling, disassembling,

reassembling, interpreting and concluding. To facilitate the coding and sorting method, I used software NVivo version 8.

Results: In the quantitative phase, almost half of the children (50.5%) were taking 85% or more of their prescribed doses. ART non-adherence rate of single orphans, double orphans, and non-orphans were 45.0%, 59.3%, and 49.7%, respectively. The multivariate analysis indicated that double orphan were positively associated with ART non-adherence compare to single orphan (AOR 2.46, 95% CI 1.17-5.19). Children whose caregiver scored low in the involvement scale (AOR 2.12, 95% CI 1.12-4.03) and stunting of the child (AOR 1.45, 95% CI 1.01-2.08) were associated with ART non-adherence. Meanwhile, children who took less than three ARV pills per day (adjusted OR 0.65, 95% CI 0.45-0.93) were associated with ART adherent. Double orphans had also lower CD4 count at the first examination, and they were older at the first sero-status detection, as well as at the ART initiation among compared to other orphan status. The first mean CD4 count prior to initiating treatment among each orphan category was 600, 520, and 844 (cells/ml), respectively ($p < 0.001$). Their mean age at sero-status detection was 5.0, 5.9, and 3.9 years old, respectively ($p < 0.001$), and their mean age at ART initiation was 6.8, 8.0, and 5.2 years old, respectively ($p < 0.001$).

In the qualitative phase, we found each orphan status had distinctive adherence barriers which were closely connected to each social background. Among double orphans, psychological distance between caregivers and children was the most noticeable barrier. However, the caregivers of double orphans who were adherent to ART had more witnessed child's behavior or health status change than the caregivers of those who were non-adherent to ART. Single orphans' caregivers expressed difficulties in managing the child's care and their job, as well as lack of food. Nevertheless, the caregivers of single orphans who were adherent to ART could ask wisely others' help or the children's autonomy for medicine taking than the caregivers of those who were non-adherent. Furthermore, we found that children's treatment fatigue and stigma should be reckoned as factors influencing their ART adherence, which were not found in the quantitative methods.

Conclusions: This study is the first to report pediatric ART adherence in Rwanda by using both quantitative and qualitative studies. In the quantitative phase, we demonstrated that double orphans had the highest risk of ART non-adherence compared with other orphan statuses. They were also in danger of initiating their ART at older age and at later stages of HIV/AIDS due to delays in their HIV detection.

In the qualitative phase, we demonstrated that the child's social context which derived from their orphan status was closely connected to ART adherence. Among double orphans, mental distance between the caregivers and the children hindered the relevant ART adherence. For single orphans, caregivers' economic burden was the major barrier to adherence.

To improve ART adherence, it is crucial, thus, to highlight the need for particular interventions for HIV positive double orphans taking into account of their social context.