Cluster Randomized Trial on the Effect of Mother Support Groups on Retention-in-Care and PMTCT Outcomes in Zimbabwe: Study Design, Challenges, and National Relevance

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Abstract: Prevention of mother-to-child transmission (PMTCT) elimination goals are hampered by low rates of retention and antiretroviral treatment adherence. The Eliminating Pediatric AIDS in Zimbabwe (EPAZ) project is assessing whether mother support groups (MSGs) increase rates of retention-in-care of HIV-positive mothers and their exposed infants, increase male participation, and improve other maternal and infant health outcomes. EPAZ is a cluster randomized study involving 30 rural facilities in 2 health districts in Mutare province in eastern Zimbabwe. Facilities were randomly assigned to either the standard-of-care or intervention arms. We established MSGs for HIV-positive mothers at the 15 health facilities in the intervention arm. MSGs met every 2 weeks and were led by an HIV-positive mother who was appointed as MSG coordinator (MSG-C). MSG-Cs contacted non-attending patient-members of support groups by cell phone. If members still do not attend, MSG-Cs inform a health worker who initiates further outreach actions that are standard within the health system. At least 10 HIV-positive mothers are enrolled per facility. Enrollment started in July 2014. The primary outcome measure is retention-in-care of HIV-exposed infants at 12 months of age. Secondary outcome measures are: retention-in-care of HIV-positive mothers at 12 months postpartum, male participation, and other maternal and child health indicators. The study relies on routine health system data supplemented by additional data using tools created for the study. If shown to improve PMTCT retention outcomes, facility-based MSGs have the potential to be scaled up throughout the Zimbabwe National PMTCT program and could be considered in other country programs.

Key Words: HIV and AIDS, prevention of mother-to-child transmission of HIV, mother support groups, retention-in-care, male participation, ART

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BACKGROUND

Zimbabwe, as one of 22 countries with the highest burden of new HIV infections among children, committed itself through the 2011 Global Plan to the goal of eliminating new pediatric HIV infections and keeping HIV-positive mothers alive. Zimbabwe has the fifth highest national adult HIV prevalence, although the rate fell from 27.0% in 1999 to 14.7% in 2012.1 Between 2008 and 2011, Zimbabwe’s prevention of mother-to-child transmission of HIV (PMTCT) program expanded with HIV infection rates in children declining by 55%.2 In 2013, the country adopted the Option B+ regimen that entails giving lifelong antiretroviral treatment (ART) to HIV-positive pregnant and breastfeeding women as soon as possible after a woman tests HIV-positive.

Although Option B+ simplifies and harmonizes regimens across PMTCT and adult ART programs and aims to assure that all HIV-positive women, including those meeting other current eligibility criteria, do actually receive ART, the effectiveness of programs depends on the critical issue of retention-in-care and ART adherence. In a 21-district survey in Zimbabwe, only 43% of 737 HIV-positive pregnant women attended for their fourth antenatal visit; among 849 exposed infants established on nevirapine prophylaxis during breastfeeding under the previous Option A, adherence was 9% for the 11th nevirapine pick-up visit.3 A multi-county meta-analysis identified unacceptably high loss to follow-up (LTFU) rates of HIV-positive mothers and HIV-exposed infants and advocated defaulter-tracking as a standard to improve retention.4

Mother support groups (MSGs) may increase retention-in-care and improve adherence to PMTCT interventions.
MSGs can provide psychosocial support, address women’s information needs, increase peer support for disclosure, reduce stigma, and improve male partner participation. However, although MSGs have been implemented extensively, supervision and monitoring of MSG activities are often weak and implementation of MSGs varies in different countries and settings. One prospective evaluation suggested that MSGs had a positive impact on some PMTCT outcomes in group members compared with non-members; however, retention was not assessed and selection bias and material incentives other than the MSG intervention may have accounted for some differences.

The Eliminating Pediatric AIDS in Zimbabwe (EPAZ) project is assessing whether MSGs increase rates of retention-in-care of HIV-positive mothers and their exposed infants, increase male participation, and improve maternal and infant health indicators. The 2 health districts in which EPAZ is being implemented were selected by the Ministry of Health and Child Care (MOHCC) to be early learning sites for Option B+. We report details of the cluster randomized design how MSGs were established at intervention health facilities and how their impact will be assessed against outcomes in HIV-positive mothers and infants at control sites.

STUDY OBJECTIVES AND FORMATIVE RESEARCH

The primary objective of the study was to determine whether the establishment of facility-based MSGs increases rates of retention-in-care of HIV-exposed infants at 1 year postdelivery compared with clinics that do not have MSGs. Secondary objectives include assessing whether MSGs at facilities lead to improved retention of HIV-positive mothers in postnatal HIV follow-up care; male participation in PMTCT activities; and uptake of other routine services including antenatal attendance, maternal ART initiation, delivery in facilities, immunizations, infant feeding practices, family planning, nevirapine prophylaxis, cotrimoxazole prophylaxis, and HIV testing postdelivery.

Formative research was conducted at study sites with health care workers (HCWs) and with HIV-positive mothers whose clinic records suggested they were LT FU. The research found that LT FU mainly occurred in delivery and postdelivery periods rather than during the antenatal period. PMTCT retention in the antenatal period was 100% at sampled sites; but at delivery, 43% of HIV-positive mothers were not recorded as having delivered at the clinic; only 53% of exposed infants underwent an early DNA polymerase chain reaction test for HIV; the number of HIV-exposed infants visiting clinics for postnatal review declined progressively with duration of follow-up.

Another formative study examined the feasibility of MSGs through interviews and discussions with HIV-positive mothers, HCWs, and community members. No MSGs had previously been established in any clinic catchment area. The concept of MSGs based at health facilities was acceptable to most informants; when asked about partner acceptability of MSGs, 90% of mothers said their partner would encourage their participation. Factors discouraging mothers from enrolling in MSGs included fear of disclosure and lack of support from partners or in-laws. Most participants thought MSGs should include economic support activities and that HCWs should play supportive rather than management roles in MSGs. The lack of space for MSG meetings was identified as a constraint at some facilities, adding to concerns around confidentiality and inadvertent disclosure.

Diverse understandings of LT FU were identified through the formative research. Because standardized definitions for LT FU were not available, the EPAZ team decided to work with 2 indicators, namely “Retention” and “Level of Retention” that were defined for the study (Table 1).

METHODS

The EPAZ study is a cluster randomized study involving 30 rural facilities (health centers, mission, and rural hospitals) in 2 health districts. Clusters consist of sites that had at least 10 HIV-positive mothers attending for antenatal care in the preceding 12 months. Clusters were randomly assigned to a standard-of-care arm or an intervention arm, and MSGs were established at intervention sites.

Study subjects consisted of pregnant HIV-positive women of 18 years of age or older attending for an antenatal care visit at or before 34-weeks gestation and living in the facility catchment area. Mothers who enrolled agreed to allow their infant, when born, to participate in the study. Mothers in the intervention arm also agreed to join the MSG at that clinic. The intervention consists of the availability of MSGs at the facility/cluster level and not individual confirmed attendance at the MSG. Mothers were enrolled consecutively at least until the minimum number at each site was reached.

In the control arm, mothers attending health facilities where there were no MSGs received Option B+ interventions according to the national protocol. No additional support was provided.

In the intervention arm, facility-based MSGs were established with limited objectives so that they were practical and manageable by community members and that could conceivably be sustained after the study finishes.

The structure and format of MSGs were designed to emphasize retention-in-care and to establish mechanisms to reduce attrition, especially in the postdelivery period. A curriculum was designed for the MSG meetings to include

| TABLE 1. Definitions of Retention-In-Care at 12 Months Postpartum |
|---------------------------------|---------------------------------|
| Retention | Attendance for follow-up at the scheduled visit in month 11 or 12 |
| Nonretention | Failure to attend for follow-up in month 11 or 12 |
| Complete retention | Attendance in month 11 or 12 and at least once in each 2-mo period, 0–10 mo |
| Partial retention | Attendance in month 11 or 12 but failure to attend in 1 or more 2-mo periods, 0–10 mo |

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activities and structured learning sessions including approaches for strengthening male partner involvement and participation in PMTCT programs. Details of the MSGs, including their structure and how often they met, are summarized in Table 2. The design of the curriculum was based on MSG curricula in other parts of Zimbabwe and southern Africa.

At each intervention site, an HIV-positive mother was appointed as MSG coordinator (MSG-C) and received standardized training on leading MSGs, retention activities, liaison with HCWs, and reporting. HCWs also received standardized training in MSG activities by EPAZ staff. After the formative research, it was decided that no financial or material payments should be made to members of the MSGs as attendance incentives and no allowances would be paid to MSG-Cs. The EPAZ team decided that MSGs should not become involved in actively supporting the economic activities of members. However, graduating members requiring economic support would be encouraged to join existing community support initiatives.

Sample Size Estimation

To estimate the minimum number of individuals to be enrolled at each site and the minimum number of clusters, we considered the total number of HIV-positive mothers seen in 30 larger rural facilities in the 2 districts. All facilities identified at least 10 HIV-positive mothers in 2013. We assumed 15 clusters in each arm, 80% statistical power, a 2-sided significance level of 5%, and an intracluster correlation coefficient of 0.15, based on estimates from a similar project involving service delivery and attendance outcomes in rural antenatal clinics in Malawi, for which the median intracluster correlation coefficients was 0.066.\textsuperscript{11}

We hypothesized that the retention rate at 12 months would be 50% in the control arm and 75% in the MSG arm. We assumed that up to 20% of routine data might not be of good enough quality to use in analyses because of known transfers out of the study area, missing data, or mortality.

Using these assumptions, the minimum number of HIV-positive pregnant women required in each arm is 150. Each cluster is therefore expected to recruit at least 10 HIV-positive pregnant women. The formula used for the minimum sample size calculation incorporates a design effect inflation factor and is described in the Sample Size Calculator documentation.\textsuperscript{12}

Outcome Measures

The primary outcome measure is retention-in-care of HIV-exposed infants at 12 months of age. Secondary outcome measures are: (1) retention-in-care of HIV-positive mothers at 12 months postpartum, (2) proportion of HIV-positive mothers who disclose their status to their partner, (3) proportion of HIV-positive mothers whose partner obtains HIV diagnostic testing, (4) proportion of HIV-positive mothers whose partner attends spouse’s antenatal visits, and (5) other maternal and child health indicators that might improve with the establishment of the MSGs. Baseline outcome measures were collected at each site before enrollment. Among infants and mothers who are not retained-in-care and for whom final status is not known (possibly due to a decision not to attend for care, migration, or death), a home visit soon after 12 months postpartum is conducted to establish their final study outcome status.

The intervention is the establishment of MSGs, and primary outcome analysis will compare retention of infants where mothers have had the opportunity to attend the MSGs or not. In addition, the frequency of actual attendance of individual mothers will also be documented and included in secondary analyses. Individual mother compliance with the intervention will be considered successful if the mother attends 8 or more MSG meetings.

Data Management

The study relies on routine health system data supplemented by additional data collected using tools created for the study. Routine data sources completed by HCWs include antenatal and delivery registers, HIV-specific registers, and patient records kept at sites. Supplementary data sources include (1) the study enrollment form and EPAZ data tool completed by HCWs and (2) the MSG enrollment form, meeting register, and meeting report form completed by MSG-Cs. Source data are abstracted by EPAZ data collectors during monthly visits to each site and are submitted to the EPAZ data manager. At the next abstraction visit, case report forms completed during the previous visit are checked by a different abstractor. Quarterly data verification visits are conducted by EPAZ staff accompanied by district health workers.

Ensuring quality data from routine data sources poses challenges. These include, among others, measurement bias due to errors from inaccurate measurement of variables. The study seeks to prospectively address potential sources of
problems and reduce measurement error through field testing of survey instruments, adequate supervisor and investigator training, data validation, and other protocols for data management. To reduce inaccurate or incomplete data entry in source documents, the study provides incentives to HCWs at sites who are responsible for data capture and management. The level of incentive is based on completeness and accuracy of general registers and HIV-related data source documents. The maximum incentives paid to HCWs at control and intervention sites are equivalent. HCWs from sites providing low-quality data receive additional training to improve data quality. Data management processes and incentives were developed with involvement of senior MOHCC staff.

Data are entered into an Epi Info 3.5.3 (Center for Diseases Control, Atlanta, Georgia) database, coded, cleaned, and locked before any analyses are made. Data will then be analyzed using Stata 12 (StataCorp, College Station, Texas).

STATUS AND TIMELINES

MSGs were established by the project between November 2013 and February 2014 with HIV-positive mothers attending the same facilities, but not enrolled to the study, to ensure there were functioning MSGs for study participants to actually join in the intervention arm. Enrollment started in July 2014. Enrollment of HIV-positive pregnant women to the 2 arms will be completed by July 2015 and follow-up will continue until December 2016. After enrollment, the quality of MSG support and retention activities and how often mothers actually attend will be monitored through structured surveillance of MSG meetings and monitoring the activities of MSG-Cs.

ETHICAL CONSIDERATIONS

The study protocol was approved by the Medical Research Council of Zimbabwe and the WHO Ethics Review Committee. The study obtains informed written consent from all mothers. Consent protocols were translated into Shona, the local language, and back-translated into English to assure accurate translation. The confidentiality of study records are safeguarded to the extent possible using dedicated study-specific storage facilities at sites. The level of risk associated with this research was considered to be minimal. Measures to reduce inadvertent disclosure risks were instituted, including training of health workers, raising awareness of group members, and developing protocols to reduce inadvertent disclosure. The study team, site HCWs, and the MSG-Cs will closely monitor the study and report and respond to any adverse event.

CHALLENGES AND LIMITATIONS

Several challenges were identified regarding this research initiative. Baseline assessment identified facilities that lacked internal meeting space; subsequent analysis may identify whether this constraint has contributed to reduced enrollment or attendance in MSGs. Baseline assessment and formative research identified poor data quality of routine data collection. Data integrity and monitoring exercises were established that incentivize accurate data collection with feedback of data quality assessments and additional training to staff at sites. It is expected that maintaining quality of routine data for study analyses will be a major challenge throughout the study.

Implementation research on retention-in-care is complex and challenging. It requires long periods of observation and consistent information systems to accurately differentiate between individuals who may move in and out of care at multiple facilities. Participants who transfer without the knowledge of the HCW at study sites are indistinguishable from subjects who have discontinued follow-up or have died. Procedures were established to recognize subjects who are transferred to other health facilities to better account for LTFU. Some sites routinely determined the status of PMTCT clients who are nonattenders through village health worker home visits. Such activities are not uniform throughout Zimbabwe’s health care system, and data concerning retention activities are not routinely recorded. Assessments will be made of the effectiveness of standard-of-care retention activities at each facility in the study.

CONCLUSIONS

Although it seems logical for PMTCT programs to invest in the establishment of MSGs to increase retention and other health outcomes, no study has rigorously tested this assumption.

Although Zimbabwe has already achieved much toward the goal of eliminating pediatric HIV infection, retaining HIV-infected mothers in the health care system especially under Option B+ offers new opportunities and challenges. A review of interventions for neonatal health found that strategies that used community mobilization such as community-based women’s groups reported significant declines in perinatal and neonatal mortality. Whether the establishment of MSGs at health facilities led by community members will also be associated with improved health outcomes remains to be seen.

MSGs would seem to support 3 of the strategic pillars of the national PMTCT program, namely retention of mother-infant pairs, male participation, and monitoring and evaluation. High-quality evidence on the effect of MSGs on retention-in-care in PMTCT programs will inform whether investment to establish MSGs throughout Zimbabwe’s 1560 health facilities is justified.
REFERENCES


