Randomised Controlled Trial of Text-Message Dosing Reminders in Patients Starting ART

POSTER 559

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INTRODUCTION

Maintaining adherence to first-line antiretroviral therapy (ART) is a key component of the WHO consolidated guidelines.

More than 87% of the South African population has a cellular phone.

Automated electronic adherence monitoring and intervention offers a cheap and scalable supplement to human resource intensive counseling methods.

There are conflicting findings on the impact of mobile phone text message reminders on adherence to antiretroviral therapy.

We designed an automated text message intervention, linked to missed ART doses, using an electronic pill box that transmitted device opening son a real time basis.

METHODS

STUDY DESIGN

A randomised controlled study over 48 weeks.

SETTING

A large community outpatient ART clinic in Cape Town, South Africa.

PARTICIPANTS

ART-naïve adults and adolescents (≥15 years) consecutively commencing ART at the site; in possession of a cell phone and willing to sign informed consent.

OBJECTIVE

To determine the impact of a real-time electronic adherence monitoring device (EAMD) on cumulative adherence to ART at week 48.

DATA COLLECTION AND ANALYSIS

All participants were given EAMD at ART study start (figure 1), and randomised (1:1) to standard of care (SoC, including 3 treatment preparedness sessions), or intervention (SoC and automated text message reminders if dosing was >30 minutes late).

EAMD dosing time was recorded for 48 weeks.

CD4count and HIV RNA were done at weeks 0, 16 and 48.

Primary outcome was adherence execution as recorded by EAMD; HIV-1 viral suppression (<40 copies/ml) at week 48 and count of treatment interruptions >72 hours were secondary outcomes.

The analysis was by intention to treat.

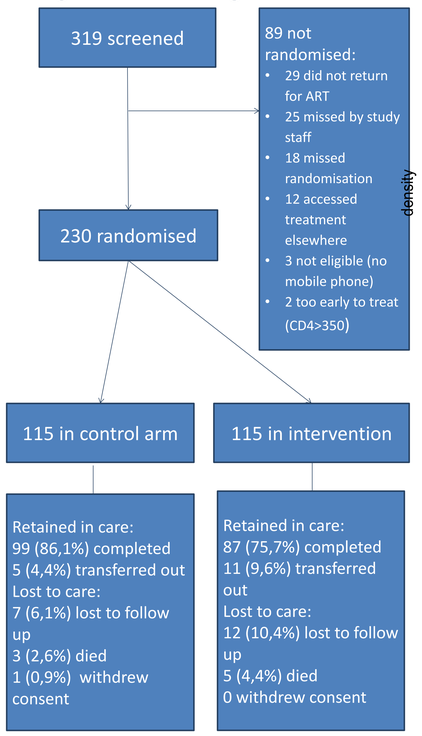
RESULTS

230 participants were randomly assigned to the control (n=115) or intervention (n=115) arms.

Table 1: Baseline demographic and clinical characteristics.

	Control	Intervention	p
Female sex: n(%)	77 (67.0)	73 (63.5)	0.678
Age in years: mean (sd)	34.3 (9.0)	34.6 (9.2)	0.779
WHO stage: n(%)			0.946
1 /2	66 (57.4)	65 (56.5)	
3 /4	49 (42.6)	40 (44.5)	
CD4 count: median (IQR)	229 (136-292)	225 (121-283)	0.543
Log viral load (copies/ml): median (IQR)	4.8 (4.4-5.4)	5.0 (4.5-5.4)	0.324
NNRTI at start: n(%) Efavirenz	115 (100.0)	113 (98.3)	0.498
NRTI at start*: n(%) Tenofovir (with 3TC or FTC)	114 (99.1)	111 (96.5)	0.361
HADS depression score of 8 or above (borderline or case)**	43 (37.4)	31 (27.0)	0.09
HADS anxiety score of 8 or above (borderline or case)**	51 (44.3)	38 (33.0)	0.08
Non-disclosure	5 (4.4)	6 (5.2)	0.757
CAGE ≥2	20 (17.4)	15 (13.0)	0.359

Figure 2: Flow diagram.



Median ADHERENCE by EAMD was 82.1% (IQR 56.6-94.6%) in the intervention arm, compared to 80.4% (IQR 52.8-93.8%) in the SoC arm (adjusted odds ratio (aOR) for adherence 1.08, 95% CI: 0.77-1.52).

The intervention messaging did not impact on cumulative adherence.

HIV-1RNA SUPPRESSION (<40 copies/ml) were seen in 80 (69.6%) of control and 75 (65.2%) of intervention (missing = failure; aOR for virological failure in intervention arm 0.77, 95%C I: 0.42-1.40, NS) at week 48.

The intervention messaging did not impact on virological outcomes.

In the intervention arm the count of TREATMENT INTERRUPTIONS (TIs) of >72hours was reduced (aIRR 0.84, 95% CI 0.75-0.94). Median duration of TIs was 8 days (IQR 5-15 days). Depression increased TIs.

There was a 16% reduction in the count of TIs in the intervention arm.

Figure 1: EAMD

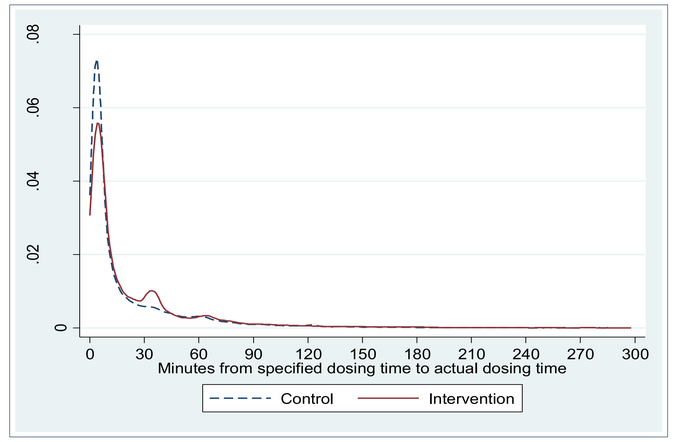


Table 2: Generalised linear model (GLM) of cumulative adherence by EAMD.

	Odds ratio	Standard error	P-value	95% confidence interval
Intervention arm	1.08	0.19	0.642	0.77-1.52
Age (per 10 years)	**1.27**	**0.01**	**0.014**	**1.05-1.52**
Anxiety score >8	1.05	0.19	0.797	0.74-1.49
Depression score >8	0.74	0.14	0.100	0.51-1.06
CD4	1.00	0.00	0.699	1.00-1.01
Male sex	0.96	0.17	0.802	0.68-1.34
Non-disclosure	0.72	0.30	0.368	0.32-1.93
CAGE ≥2	1.05	0.45	0.819	0.67-1.67

RESULTS

Figure 3: median time (in minutes) from the dosing time specified by each participant to the actual time of dosing.



The area under the curve equals to one. The y-axis shows the frequency / proportion of patients taking their dose at that time point. In the intervention arm (solid line) the effect of individuals waiting for the text message at 30 minutes after their specified dosing time can be seen.

CONCLUSION

Systematic reviews and meta-analyses have concluded that text messaging, twice weekly or less, is a potentially cost-effective and accessible option to support adherence to antiretroviral therapy.

Our randomised controlled trial found that the use of a novel, wireless, electronic adherence monitoring device, which generated a text message reminder for device openings >30 minute late, significantly reduced the frequency of treatment interruptions longer than 72 hours, but had no effect on overall adherence execution, or HIV RNA suppression .

Treatment interruptions >72 hours have been shown to be a significant cause of virologic failure and acquisition of drug resistance.

Future studies are needed to determine best timing of the reminders and whether the level of adherence support supplied by electronic monitoring can replace intensive counselling linked with home visits in this population.

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