

Patient-Reported Outcomes in First-Line Antiretroviral Therapy: Results From NEAT001/ANRS143 Trial Comparing Darunavir/Ritonavir in Combination With Tenofovir/Emtricitabine or Raltegravir

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Background: There are few data comparing patient-reported outcomes (PROs) in randomized trials of initial antiretroviral therapy. We present results from a substudy of the NEAT001/ANRS143 trial.

Methods: The randomized trial compared first-line DRV/r 800/100 mg once daily plus RAL 400 mg twice daily and DRV/r plus TDF/FTC 245/200 mg once daily. Changes in PROs were assessed with 3 questionnaires: EuroQoL 5 domains (EQ-5D), Center for Epidemiologic Studies Depression (CES-D) scale, and HIV Treatment Satisfaction Questionnaire. Major depressive disorder (MDD) was defined as CES-D \geq 16. General estimating equations were used to model change over 96 weeks in PROs from baseline.

Results: Of the 805 participants, 797 (99%) contributed to the substudy. Baseline PRO data were similar for the 2 randomized groups. Health status improved over time with a mean increase in EQ-5D visual analogue scale (VAS) of 8.0 by W96 [95% confidence interval (CI): 6.5 to 9.4; $P < 0.001$], and no statistically significant differences between groups (difference of 0.3 on VAS score [95% CI: -1.7 to 2.3]; $P = 0.7$, global P value ≥ 0.05 for all domains over follow-up). There was no significant difference between groups on CES-D [difference of -0.1 (95% CI: -1.3 to 1.1); $P = 0.9$], or MDD during follow-up, adjusted for baseline MDD (odds ratio = 0.98, 95% CI: 0.82 to 1.18; $P = 0.9$). RAL + DRV/r group had lower level of convenience ($P = 0.03$) and fitted less well into patients' lifestyle ($P = 0.007$) than the TDF/FTC + DRV/r regimen, and was associated

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Members of the NEAT 001/ANRS 143 Study Group are listed in the Appendix 1.

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with lower treatment satisfaction [median score: 53 RAL + DRV/r vs 55 TDF/FTC + DRV/r ($P = 0.001$)].

Conclusion: PROs improved after starting antiretroviral therapy, with no statistically significant difference between groups. The lower satisfaction with RAL + DRV/r may be explained by twice-daily administration.

Key Words: quality of life, raltegravir, treatment satisfaction, EQ-5D, ritonavir-boosted darunavir, health improvement

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INTRODUCTION

Antiretroviral therapy (ART) has dramatically reduced mortality and morbidity at all stages of HIV infection,^{1,2} making an overall improvement of patients' health status an important goal of therapy. In fact, according to most recent guidelines, one of the key treatment goals is to "prolong the quality of survival."³ In this context, patient-reported outcomes (PROs) have been recognized as an important measure of health that deserves to be taken into account, together with the traditional efficacy and safety parameters, when measuring a patient's health status both in research and clinical practice. Indeed, there is compelling evidence that both HIV infection and prolonged ART can impair PROs such as health-related quality of life (HRQL), fatigue, and work productivity.⁴ Assessment of PRO measures is of particular interest when two or more therapeutic strategies have the same clinical efficacy because PROs are the major drivers of adherence to long-term ART.⁵ In fact, PROs during treatment may explain the gap that is frequently reported between efficacy rates and those reported for the effectiveness of ART in the real world practices. PROs are also important surrogates for patients' experience with their disease and its treatment.⁶ Combined, these reasons make PROs important endpoints for clinical trials to identify the strategy that maximizes the patient's health status and irreplaceable sources of important information in clinical practice.⁷ A large European NEAT001/ANRS143 randomized multicenter trial that compared 2 different ART regimens for first-line treatment in naive patients showed non-inferiority based on a virological composite primary outcome at 96 weeks. There was also no difference in the frequency of serious or treatment-modifying adverse events. We report the results of a specific PROs' substudy nested within the NEAT001/ANRS143 large clinical trial.

PARTICIPANTS AND METHODS

Study Treatment and Participants

NEAT001/ANRS143 was a randomized, open-label, non-inferiority trial conducted in 15 European countries between August 2010 and October 2013. The full study design and results have been previously reported.⁸ Briefly, 805 naive HIV-infected adults were randomly assigned in a 1:1 ratio to receive oral treatment with 800-mg darunavir and 100-mg ritonavir once daily plus either 400-mg

raltegravir twice daily [nucleotide reverse transcriptase inhibitor (NtRTI)-sparing regimen] or tenofovir/emtricitabine in a 245- and 200-mg fixed dose combination once daily (standard regimen). Participants were offered to participate in the PROs' substudy. Ethics committee approval was obtained for all participating centers, in accordance with the principles of the Declaration of Helsinki. All trial participants gave written informed consent. The study was registered with ClinicalTrials.gov (NCT01066962).

Data Collection

Participants attended study centers at screening, baseline (randomization), weeks 2, 4, 8, 12, 18, 24, 32, 48, 64, 80, and 96, and every 12–16 weeks thereafter. Each visit included assessment of vital signs and adverse events, physical examination, and collection of blood samples for full blood cell counts and serum chemistry, liver function, and immunovirological measurements, except at W2 for the latter. Adverse events recorded during the study were grouped based on the body system as previously described.⁸

Patient-Reported Outcomes

PROs were collected at baseline and during scheduled follow-up visits at weeks 4, 12, 24, 48, and 96 through self-administered questionnaires in participants' native languages. Four PRO questionnaires were used in this study: (1) the EuroQoL 5 domains (EQ-5D),⁹ a widely used generic questionnaire for measuring health-related quality of life (HRQL), that includes 2 parts. The EQ-5D self-classifier asks participants to describe their health on 5 domains: (mobility, self-care, usual activities, pain/discomfort, and anxiety/depression) and 3 levels: (1) indicating "no problem," (2) indicating "some or moderate problems," and (3) indicating "extreme problems/impossible to do." The EQ-VAS is a visual analogue scale (VAS) that takes values between 100 (best imaginable health) and 0 (worst imaginable health) on which participants provide an overall measure of their health status; (2) the ISS-NEAT HIV symptoms scale, a self-administered list of 38 symptoms,¹⁰ that evaluates the impact of symptoms over the past 4 weeks through a Likert 5-point intensity scale rated from "not at all" = 1 to "a very great deal" = 5; (3) the Center for Epidemiologic Studies Depression (CES-D), that asks participants to rate how often over the past week they experienced symptoms associated with depression, with response options ranging from 0 to 3 for each item (0 = rarely or none of the time, 1 = some or little of the time, 2 = occasionally or moderately, and 3 = most or all the time). Major depressive disorder (MDD) was defined as CES-D ≥ 16 . In this study, a short version of 10 items was used¹¹; and (4) the HIV Treatment Satisfaction Questionnaire (HIVTSQ) measuring overall satisfaction with HIV treatment and by specific domains such as convenience, ease of use, and flexibility through a 10-item self-reported scale with a maximum possible score of 60.¹²

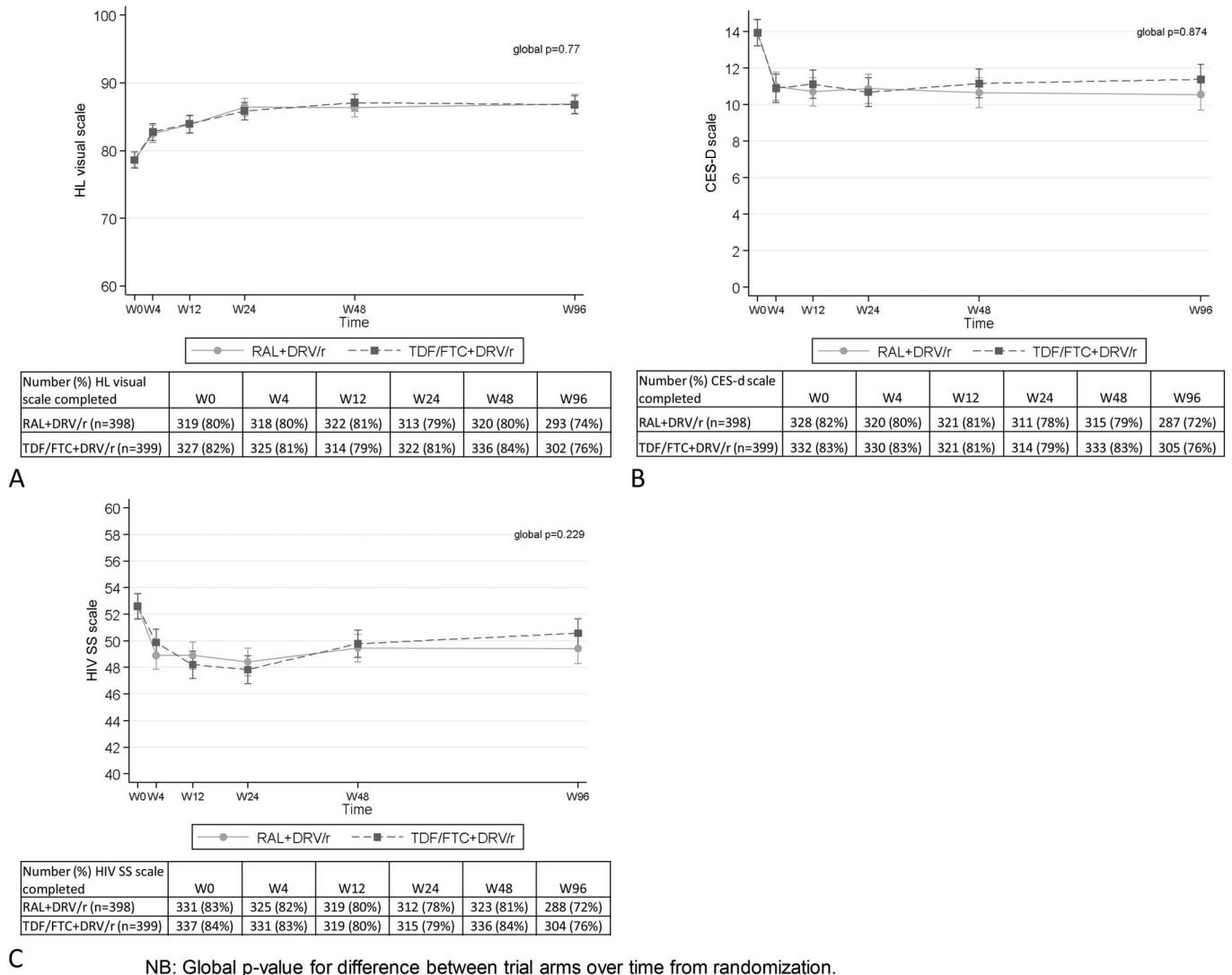


FIGURE 1. A, EQ-VAS for current health over follow up; (B) CES-d scale over follow up; (C) HIV symptoms scale over follow up.

Statistical Analyses

Together with clinicodemographic parameters, the PROs at and during follow-up were compared between the 2 trial treatments using Pearson's χ^2 test for categorical variables or *t* tests and Wilcoxon rank sum tests for continuous variables. The two treatment groups were compared as randomized, according to the intention-to-treat principle. Generalized estimating equations (GEEs) including all participants that contributed one or more questionnaires were used to model: change over time in PROs from baseline; odds of MDD during the trial adjusted for baseline MDD; and odds of having moderate or severe problems (compared with no problems) on EQ-5D domains adjusted for baseline levels. GEEs were used because the models can handle missing measurements without the need for imputation and have been shown to be a viable analysis for PROs in HIV trial data.¹³ Within the GEE models, potential differences between arms and visit weeks were accounted for with interaction terms.

Sensitivity analyses were performed by imputing missing values of PROs at each time point using multiple imputation with chained equations (with predictive mean matching for CES-D and EQ-VAS, and regression for HIV symptoms scale) and then changing the imputed values to test the assumption that the group who had missing data had systematically worse or better outcomes.¹⁴ Baseline factors that were associated with change in EQ-5D VAS over time (age, sex, country of enrollment, body mass index, mode of infection, ethnicity, HIV stage, CD4, and log₁₀ plasma HIV RNA) were included in the GEE model. Levels of treatment satisfaction between groups were compared with χ^2 tests in participants with questionnaires at baseline and W96 and logistic regression for the % very satisfied at W96 adjusted for baseline factors. This time point was in line with the primary endpoint for the main trial measured once all participants had reached W96. For this PROs' substudy, no predetermined

sample size was calculated. Statistical analyses were performed using Stata v14.0.

RESULTS

Baseline Characteristics and Data Completeness

Of the 805 participants, 797 (99%) contributed to the substudy: 683/797 (86%) at baseline, 611 (77%) at W96, and 526 (66%) at both visits. A minimum of 74% participants contributed to PRO data at each visit and >80% contributed at visits within the first 12 weeks (Fig. 1A). There was no significant difference between randomized groups for completeness of data at each visit and overall (global *P* value from GEE models for missingness of CES-D scale, EQ-VAS, and HIV symptoms scale was 0.10, 0.41, and 0.28, respectively). Baseline characteristics and PROs of the participants contributing at baseline were not different between treatment groups (Table 1) and were similar to those of the 805 participants randomized to the main NEAT001/ANRS143 trial.

PRO Measures

There were no significant differences between randomized groups for any of the EQ-5D domains including VAS over time (Table 2 and Fig. 1A). During follow-up, an improvement of participant overall health status (EQ-VAS) was observed in both randomized groups, with a marked increase during the first 24 weeks of therapy {difference from baseline of 7.5 [95% confidence interval (CI): 6.5 to 8.5]; *P* < 0.001}, then a plateau; however, there were no statistically significant differences between randomized groups at any time point (Fig. 1A). A reduction of the HIV symptoms scale was observed in first 4 weeks [difference from baseline of -3 (95% CI: -4 to -2); *P* < 0.001] for standard regimen, with stabilization up to W96 and no statistically significant differences between the 2 randomized groups (Fig. 1B). Depression/anxiety as measured on the CES-D scale also improved, as by week 4, statistically significant improvement was evidenced in both groups [difference of -3 (95% CI: -4 to -2); *P* < 0.001], with no difference between the 2 groups (Fig. 1C). Sensitivity analyses showed that under the assumptions that participants with missing PROs either had systematically worse or better outcomes, there were no significant differences between randomized groups for EQ-VAS, CES-D, or HIV symptoms scale (Table 1, Supplemental Digital Content <http://links.lww.com/QAI/B211>). There was no evidence of a difference between groups in MDD during the 96-week duration of the study [odds ratio (OR) 0.98, 95% CI: 0.82 to 1.18]. At W96, participants in the NtRTI-sparing regimen reported significantly lower median score in treatment satisfaction than participants in the standard regimen {53 [interquartile range (IQR) 48–58] vs 55 (IQR 50–59); Kruskal–Wallis *P* = 0.001}. There were no differences between groups on satisfaction regarding general satisfaction, satisfaction with control and understanding of disease, side effects, or wish to continue current treatment (Table 3).

PRO Predictors

Age (Wald test *P* < 0.001) and country of enrollment (overall Wald test *P* = 0.05) were found to be independently associated with change in overall health status adjusting for the other baseline factors and baseline EQ-5D VAS. Older age was associated with lower VAS [decrease of -0.1 (95% CI: -0.2 to -0.05) per age year], and 2 countries were associated with increased VAS {Hungary [n = 6, increase of

TABLE 1. Baseline Patient-Reported Outcomes and Characteristics

Patient-Reported Outcomes	RAL + DRV/r	TDF/FTC + DRV/r
Median (IQR) CES-D score; N	12 (7, 18); 328	12 (7, 19); 332
Major depressive disorder (%)	121/328 (37%)	110/332 (33%)
Median (IQR) HIV symptoms scale; N	49 (43, 59); 331	49 (42, 59); 337
EuroQoL (EQ-5D) domains (% moderate or severe problems)		
Mobility	11/335 (3%)	11/342 (3%)
Self-care	2/335 (<1%)	5/341 (1%)
Usual activities	26/336 (8%)	26/340 (8%)
Pain/discomfort	79/335 (24%)	90/341 (26%)
Anxiety/depression	143/336 (43%)	145/340 (43%)
Median (IQR) EQ-5D VAS; N	80 (70–90); 319	80 (70–90); 327
Baseline characteristics for those with any baseline PRO recorded		
Mean (SD) age (yr)	38 (10)	39 (10)
Male (%)	299 (88%)	305 (89%)
Mean (SD) baseline CD4 (mm ³)	328 (7)	315 (7)
Mean (SD) baseline HIV RNA (log ₁₀ c/mL)	10.9 (0.08)	10.8 (0.08)
Mean (SD) body mass index (kg/m ²)	23.8 (0.2)	23.7 (0.2)
Mode of contamination*		
Homosexual/bisexual sex	230 (72%)	235 (71%)
Heterosexual sex	81 (25%)	83 (25%)
Intravenous blood use	7 (2%)	10 (3%)
Blood or blood product receipt	1 (<1%)	0 (0%)
Other	3 (1%)	4 (1%)
Ethnic origin		
White	281 (83%)	284 (83%)
Black	43 (13%)	36 (11%)
Asian	6 (2%)	8 (2%)
Other	10 (3%)	15 (4%)
HIV stage		
A	279 (82%)	284 (83%)
B	44 (13%)	43 (13%)
C	17 (5%)	18 (5%)

*Percentages are based only on patients with available data (RAL + DRV/r n = 318, TDF-FTC+DRV/r n = 329); 7 patients had more than one risk factor (RAL + DRV/r n = 4, TDF-FTC+DRV/r n = 3). There was no evidence of differences in any baseline characteristic or PRO between the randomized arms in those that had any baseline PRO recorded.

TABLE 2. Odds Ratios of RAL + DRV/r vs TDF/FTC + DRV/r for Having Moderate or Severe Problems in the EQ-5D Domains Over Follow-up

EQ-5D Domain	OR of RAL + DRV/r vs TDF/FTC + DRV/r (95% CI)					
	W4	W12	W24	W48	W96	Global, <i>P</i>
Mobility (n = 677)	0.77 (0.32 to 1.90)	0.52 (0.20 to 1.36)	4.18 (1.12 to 15.66)	2.19 (0.83 to 5.82)	2.41 (0.97 to 5.96)	0.05
Self-care (n = 677)	1.26 (0.15 to 10.93)	0.49 (0.13 to 1.92)	0.71 (0.05 to 9.51)	0.26 (0.03 to 2.63)	0.24 (0.02 to 2.35)	0.80
Usual activity (n = 676)	0.99 (0.47 to 2.07)	0.98 (0.45 to 2.11)	0.98 (0.43 to 2.24)	0.77 (0.35 to 1.66)	0.75 (0.33 to 1.68)	0.99
Pain or discomfort (n = 676)	0.74 (0.48 to 1.16)	1.13 (0.72 to 1.79)	1.63 (1.01 to 2.64)	0.96 (0.60 to 1.52)	1.12 (0.69 to 1.82)	0.26
Anxiety or depression (n = 676)	1.09 (0.72 to 1.67)	1.14 (0.74 to 1.74)	0.87 (0.57 to 1.34)	1.10 (0.71 to 1.69)	1.33 (0.84 to 2.10)	0.85

11 (95% CI: 1 to 21); *P* = 0.03] and Portugal [n = 21, increase of 12 (95% CI: 3 to 21); *P* = 0.007]. The potential baseline predictors were also included in the models for change in CES-D and HIV symptoms scale adjusted for their baseline values. Age was found to be an independent predictor of change in the model for HIV symptoms scale with older age associated with an increased score [increase of 0.1 per age year (95% CI: 0.03 to 0.2); *P* = 0.006]. Sex was found to be an independent predictor of change in CES-D score with female sex (including transgender male to female) associated with an increased CES-D score [increase of 2 (95% CI: 0.1 to 4); *P* = 0.04].

Multivariate Analysis of Treatment Satisfaction

A logistic regression model was fitted for the proportion of participants who responded with 5 or 6 (very satisfied) on each question on the HIVTSQ at W96 adjusted for treatment group, age at enrollment, sex, and change from baseline in the other PRO measures (CES-D, EQ-5D VAS, and HIV symptoms scale). The proportions of participants feeling very satisfied with convenience, extent with which treatment fits into their lifestyle, and who would recommend their treatment to a friend were higher in the standard regimen after adjustment (Table 3).

DISCUSSION

Our data indicate that most PRO domain scores measured with 4 different validated instruments significantly improved during first-line antiretroviral treatment. Previous studies have shown reduction of fatigue and HIV symptoms in HIV-infected patients initiating ART,^{15,16} but few studies have evaluated PROs in a randomized comparative study.

In our study, improvement of PRO scores started shortly after the initiation of therapy and then plateaued between 6 months and 2 years on continuous therapy, suggesting that PROs’ benefit was maximal when plasma virologic suppression was achieved and did not increase thereafter. For 3 of the PRO measures assessed, HRQL, HIV symptoms scale, and CES-D, improvement was not different between the 2 randomized groups either overall or any time point of follow-up. These results represent additive arguments to the hypothesis that PRO improvement is related to

virologic suppression achievement rather than to a specific drug regimen. However, it is interesting to note that PRO improvement in the 1st week after treatment initiation was of similar magnitude in both randomized groups, although at W4 and W24, a significantly higher proportion of participants achieved virologic suppression on the NtRTI regimens, while at 96 weeks, both regimens were virologically noninferior.⁸ The underlying mechanisms to connect HIV plasma suppression with PRO improvement are yet to be elucidated.¹⁷ Some putative mechanisms may be related to the improvement of cytokine and other metabolites profile, both in peripheral blood and central nervous system, because of the viral suppression that could in turn positively impact patients’ experience.¹⁸ Viral suppression might thus improve fatigue and other PROs related to chronic HIV infection.¹⁹

Our multivariate analysis showed an association between older age and lower health-related outcomes. Poorer PROs in older patients has been reported in many studies on HCV treatment, including the most recent ones with highly effective and very well-tolerated direct-acting antiviral regimens.²⁰ Older age was negatively associated with physical Fatigue Impact Scale subscores in an observational study on raltegravir,¹⁹ while in a review of literature, there was no association between age and fatigue in most studies.²¹ HIV disease factors, such as US Centers for Disease Control and Prevention (CDC) stage, CD4, and plasma HIV RNA, did not influence PRO improvement, indicating that benefit of HIV therapy on quality of life was seen whatever the baseline immunovirological status of the patient, taking into account that 15 patients in our study had CD4 cell counts < 200/mm³ and only 5% CDC stage C HIV infection.

Association of worsening of depression score in women over time might be related to higher difficulty to cope with HIV disease or to higher vulnerability or perceived stigma. Most studies in an HIV-positive population have showed a higher rate of depression in women than men;²² however, no longitudinal study over a 2-year period has been reported. The difference found in improved overall health status by country, as measured by EQ-VAS, was driven by differences in Hungary and Portugal, and could be due to the small numbers enrolled in the trial in these countries because modest absolute differences from baseline in small groups can have a large impact. HIVTSQ scores for treatment convenience, fitting into lifestyle, and willingness to recommend to

TABLE 3. Odds Ratios of RAL + DRV/r vs TDF/FTC + DRV/r for Proportion With a “Very Satisfied” Response on the HIVTSQ at W96 and Impact of Adjusting for Potential Confounders by Logistic Regression

Treatment Satisfaction Question at W96 [% Very Satisfied (5 or 6)]	RAL + DRV/r	TDF/FTC + DRV/r	Unadjusted OR (95% CI) for RAL vs TDF/FTC	Adjusted OR*	Other Significant Factors in Model [OR (95% CI)]
Satisfied with current treatment	238/268 (89%)	269/288 (93%)	1.78 (0.98 to 3.25); <i>P</i> = 0.06	1.55 (0.75 to 3.19); <i>P</i> = 0.24	Age [1.03 (95% CI: 1.0 to 1.08)]
Satisfaction with how well HIV was controlled	250/268 (93%)	277/287 (97%)	1.99 (0.90 to 4.40); <i>P</i> = 0.09	1.99 (0.77 to 5.18); <i>P</i> = 0.16	HIV symptoms scale change from baseline [0.92 (95% CI 0.89 to 0.96)] and EQ-5D VAS change from baseline [1.03 (95% CI 1.00 to 1.06)]
Satisfied with extent of unwanted side effects	234/267 (88%)	250/287 (87%)	0.95 (0.58 to 1.57); <i>P</i> = 0.85	0.88 (0.48 to 1.60); <i>P</i> = 0.67	HIV symptoms scale change from baseline [0.96 (95% CI: 0.94 to 0.99)]
Satisfaction with how demanding treatment is	180/267 (67%)	220/286 (77%)	1.61 (1.11 to 2.34); <i>P</i> = 0.01	1.43 (0.91 to 2.24); <i>P</i> = 0.12	HIV symptoms scale change from baseline [0.98 (95% CI: 0.95 to 1.00)], age [1.03 (95% CI: 1.00 to 1.05)], and sex [2.72 (95% CI: 1.03 to 7.18)]
Convenience	209/268 (78%)	249/287 (87%)	1.84 (1.18 to 2.89); <i>P</i> = 0.007	1.86 (0.08 to 3.23); <i>P</i> = 0.03	HIV symptoms scale change from baseline [0.96 (95% CI: 0.94 to 0.99)]
Flexibility of treatment	176/271 (65%)	217/285 (76%)	1.72 (1.19 to 2.49); <i>P</i> = 0.004	1.54 (0.99 to 2.38); <i>P</i> = 0.06	CES-D score change from baseline [0.96 (95% CI: 0.93 to 0.98)], age [1.02 (95% CI: 1.00 to 1.05)], sex [3.44 (95% CI: 1.30 to 9.10)]
Satisfaction with understanding of HIV	232/266 (87%)	252/287 (88%)	1.05 (0.64 to 1.74); <i>P</i> = 0.84	1.08 (0.60 to 1.94); <i>P</i> = 0.78	
Extent with which treatment fits into lifestyle	203/264 (77%)	250/287 (87%)	2.03 (1.29 to 3.17); <i>P</i> = 0.002	2.12 (1.22 to 3.66); <i>P</i> = 0.007	
Recommendation to a friend	230/266 (86%)	267/288 (93%)	1.99 (1.13, 3.51); <i>P</i> = 0.02	2.21 (1.09 to 4.51); <i>P</i> = 0.03	
Continuation of treatment	230/266 (86%)	252/286 (88%)	1.16 (0.70 to 1.92); <i>P</i> = 0.56	1.43 (0.77 to 2.63); <i>P</i> = 0.26	EQ-5D VAS scale change from baseline [0.97 (95% CI: 0.95 to 0.99)] and CES-D change from baseline [0.95 (95% CI: 0.91 to 0.99)].

*Adjusted for change from baseline in CES-D, HIV symptoms scale, and EQ-5D VAS and baseline factors: age (yr) and sex (transgender male to female = female, ORs estimated for female vs male).

a friend were significantly higher in participants taking the 3-pill once-daily DRV/r + TDF/FTC regimen compared with 4-pill DRV/r + RAL regimen requiring twice-daily intake, possibly reflecting a preference for a simplified regimens with less daily intake. A meta-analysis of randomized clinical trials has shown that lower pill burden was associated with both better adherence and virological suppression.²³ However, once-daily regimens were associated with slightly better adherence, but not virological suppression, as compared with twice-daily regimens.²³ Absence of differences in satisfaction with regards to side effects and HIV disease control and knowledge between randomized groups is in line with findings of the study showing non-inferiority of virological efficacy and no differences in safety over follow-up.⁸ In fact, even if participants were less satisfied with twice-daily regimens and less prone to recommend such a regimen, this did not translate in poorer outcome at W96. Indeed, the finding of a 2-point difference in treatment satisfaction score, although statistically significant, did not seem to have much clinical relevance because it did not seem to be associated

with any adverse patient-reported or clinical outcomes. Furthermore, participants on twice-daily DRV/r + RAL regimen were equally satisfied to continue on their current regimen than those on once-daily DRV/r + TDF/FTC, probably because of perceived benefit in terms of virologic suppression and immunologic recovery.

The study limitations primarily arise from the nature of any clinical trial study that has strict enrollment criteria and close follow-up. In this context, the findings from an efficacy trial may potentially have limited generalizability to the entire HIV population. However, the design of our study was pragmatic with a wide range of enrollment criteria and similar follow-up to routine care. In addition, some parameters that could potentially be associated with PROs were not collected during the study. These include level of education, marital status, income, and type of work. Finally, some of the PRO instruments were not systematically validated in all languages used in this study. Nevertheless, all these instruments have been systematically translated with some face-to-face and content validation. We also acknowledge that EQ-5D might

lack sensitivity and may not capture subtle differences in participants' quality of life.

In summary, this randomized-controlled trial of twice-daily DRV/r + RAL vs once-daily DRV/r + TDF/FTC demonstrated significant and persistent improvement of PRO scores during treatment. PROs improve rapidly after treatment initiation, with no difference between arms, reflecting probable improvement in immunovirologic status and/or suggestive perception of disease control while on therapy. However, treatment satisfaction was significantly lower with the twice-daily regimen for convenience and fitting into the participants' lifestyles, without affecting W96 outcome. These findings provide a comprehensive approach when treating and selecting initial ART in HIV-infected participants.

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APPENDIX 1. NEAT 001/ANRS 143 Study Group

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