H–1239

Reduction in AIDS-defining events/death with etravirine compared to placebo: pooled DUET 48-week results

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Abstract

Background

The clinical benefit of newer regimens for treatment-experienced patients is unknown.

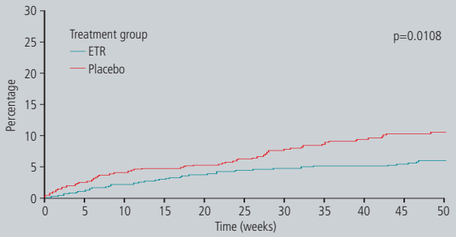
Methods

AIDS-defining events (ADEs) were adjudicated by an independent panel (confirmed or probable) from two placebo-controlled studies of etravirine (ETR; TMC125) administered with a background regimen (BR) of darunavir (DRV) + NRTI(s) and optional enfuvirtide (ENF). Prespecified analyses were done using all patients and stratified by de-novo or not de-novo (including recycled ENF or not used) ENF use.

Results

One thousand, two hundred and three patients had a baseline median CD4 cell count of 105, $\log_{10}$ HIV RNA of 4.8 and 59% had a Centers for Disease Control and Prevention (CDC) C classification. Overall, 59 (9.8%) of placebo and 35 (5.8%) of ETR patients had an ADE/death (ADE/D) (p=0.0408). Twenty-two ADE/D occurred in the first 30 days (16 in the placebo group). Time to ADE/D was significantly shorter for placebo than ETR (see figure). The most common ADEs were candida esophagitis (10), pneumocystis jiroveci pneumonia (9), herpes simplex virus (HSV) (8), mycobacterium avium complex (MAC) (7), cytomegalovirus (CMV) retinitis (6) and kaposi's sarcoma (KS) (6). During the treatment period, death was the first event in seven of 20 placebo and eight of 12 ETR patients.

In the sub-group on de-novo ENF (n=312), events were similar. However, in those not on de-novo ENF (n=891), placebo had more events than ETR (10.1% vs 5.4%; p=0.0086).



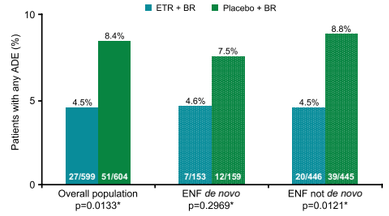
Conclusions

In addition to virologic and immunologic benefits, use of ETR was associated with a significant longer time to ADE/D compared to placebo in treatment-experienced patients.

Pooled 48-week DUET analysis: baseline characteristics

Parameter, % or median (range)	ETR + BR (n=599)	Placebo + BR (n=604)
Treatment duration at time of analysis (weeks)	52.3 (1.6–85)	51.0 (3.4–80)
Patient demographics		
Male	90	89
Caucasian	70	70
Age (years)	46 (18–77)	45 (18–72)
Disease characteristics		
Viral load ($\log_{10}$ copies/mL)	4.8 (2.7–6.8)	4.8 (2.2–6.5)
Viral load ≥100,000 copies/mL	38	36
CD4 cells (cells/mm³)	99 (1.0–789)	109 (0.0–912)
CD4 cells <50 cells/mm³	36	35
Baseline CDC category		
CDC category A	21	21
CDC category B	21	19
CDC category C	58	59

Proportion of patients with any confirmed or probable ADE

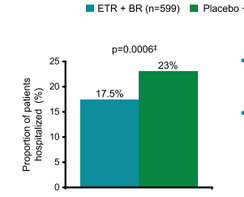


*Logistic regression with factors treatment, trial, baseline viral load, ENF use and interaction between treatment and ENF

Description of deaths

- Forty-one patients died in the pooled DUET trials
  - eight due to an AE during screening, 32 during the treatment period (ETR, n=12; placebo, n=20) and one during follow-up (ulcerative colitis)
- In the ETR + BR group, all fatal AEs were considered not or doubtfully related to treatment
- In the placebo + BR group, one patient had a fatal serious AE considered possibly related to treatment (acute renal failure)
- Treatment-emergent AEs leading to death were mainly associated with disease progression or HIV-related complications
  - the most common fatal AEs were related to infections (ETR + BR group, 1% [n=6]; placebo + BR, 2% [n=12])
- During the treatment period, 13 out of 20 and four out of 12 patients in the placebo + BR and ETR + BR groups, respectively, presented with an ADE prior to death

Proportion of patients hospitalized by Week 48*



- Significantly fewer patients in the ETR + BR group were hospitalized than in the placebo + BR group (p=0.0006)
- 5.3% patients were hospitalized more than once in the ETR + BR group vs 9.6% patients in the placebo + BR group (p=0.0112)

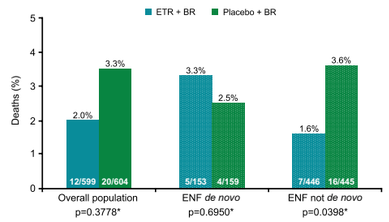
*Only hospitalizations with admission date up to and including 48 weeks after baseline are included
‡p value derived from logistic regression model with factors treatment, trial, baseline viral load, ENF use and interaction between treatment and ENF

Assessment of clinical outcomes (ADEs and deaths)

- Clinical endpoints were defined as a combination of ADEs and deaths and were identified using methods described in the ESPRIT[1] and SMART[2] trials
- ADEs were identified using reported adverse event (AE) terms appearing as category C illnesses*
- ADEs were reviewed, certified and validated by an independent expert adjudication panel blinded to treatment allocation
  - events adjudicated as confirmed or probable category C events were considered as ADEs
  - events adjudicated as not category C events or not enough information were not considered as ADEs
- Primary analysis: all confirmed or probable ADEs or deaths
- At the time of this analysis, all patients were treated for ≥48 weeks or had discontinued
- Statistical analyses were performed on the overall ITT population and according to ENF use (re-use/no use [not *de novo*], or use for the first time [de novo])

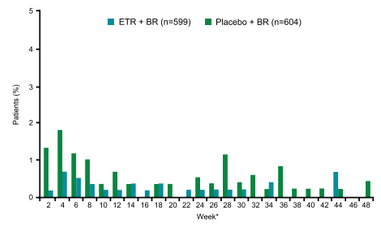
*From the 1993 revised classification system for HIV issued by the US CDC; ITT = intent-to-treat
[1]Emery S, et al. Control Clin Trials 2002;23:198–220; [2]SMART Study Group. N Engl J Med 2006;355:2283–96

Proportion of deaths in the treatment period



*Logistic regression with factors treatment, trial, baseline viral load, ENF use and interaction between treatment and ENF

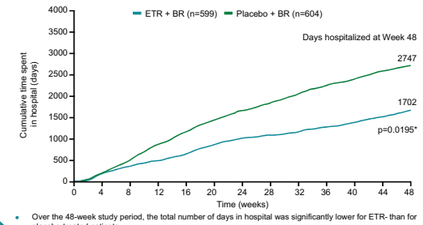
Incidence of ADEs over time



- Twenty-one ADEs occurred in the first 30 days of treatment (16 in the placebo + BR group and five in the ETR + BR group)

*2 = Week 1–2; 4 = Week 3–4; 6 = Week 5–6, etc

Cumulative hospital days over 48 weeks



- Over the 48-week study period, the total number of days in hospital was significantly lower for ETR- than for placebo-treated patients
  - the median duration of hospitalization per patient was lower in the ETR + BR group than in the placebo + BR group (9 vs 10 days, respectively)

*p value derived from a t-test correcting for treatment

Pooled 48-week DUET analysis: efficacy and safety overview

- Primary efficacy endpoint – confirmed virologic response
  - patients receiving ETR + BR achieved significantly greater virologic response rates (viral load <50 copies/mL) than with placebo + BR (61% and 40%, respectively; p<0.0001)[1,2]
- Safety and tolerability
  - aside from rash, ETR displayed a favorable safety and tolerability profile when compared to placebo[1,2]
    - rash was mild-to-moderate, occurred within the first few weeks of treatment, resolved with continued use and infrequently led to discontinuation

[1]Trottier B, et al. CAHR 2008. Poster P167; [2]Cheret A, ISHEID 2008. Oral presentation

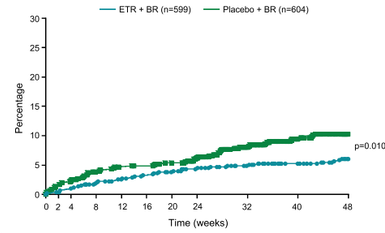
Summary of clinical outcomes over 48 weeks of treatment

Parameter, n (%)	ETR + BR	Placebo + BR
Overall population	n=599	n=604
Any confirmed or probable ADE/death	35 (5.8)*	59 (9.8)
Any confirmed or probable ADE	27 (4.5)	51 (8.4)
Any confirmed ADE	20 (3.3)	30 (5.0)
Any probable ADE	8 (1.3)	25 (4.1)
Death	12 (2.0)	20 (3.3)
ENF *de novo*	n=153	n=159
Any confirmed or probable ADE/death	11 (7.2)‡	14 (8.8)
Any confirmed or probable ADE	7 (4.6)	12 (7.5)
Any confirmed ADE	4 (2.6)	8 (5.0)
Any probable ADE	3 (2.0)	4 (2.5)
Death	5 (3.3)	4 (2.5)
ENF not *de novo*	n=446	n=445
Any confirmed or probable ADE/death	24 (5.4)§	45 (10.1)
Any confirmed or probable ADE	20 (4.5)	39 (8.8)
Any confirmed ADE	16 (3.6)	22 (4.9)
Any probable ADE	5 (1.1)	21 (4.7)
Death	7 (1.6)	16 (3.6)

Thirty-two patients died during the treatment period (12 and 20 patients in the ETR + BR and placebo + BR groups, respectively); All deaths in the ETR + BR group were considered not or doubtfully related to ETR; one death in the placebo + BR group was considered possibly related to the BR

*p=0.0408; ‡p=0.6114; §p=0.0086; Logistic regression with factors treatment, trial, baseline viral load, ENF use and interaction between treatment and ENF

Time to first confirmed/probable ADE or death: overall

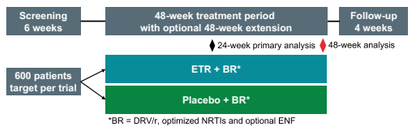


*p value derived from log-rank test

Conclusions

- There was a significant reduction in clinical endpoints (ADE or death) in ETR + BR treated patients compared with placebo + BR in the pooled DUET trials
  - significant benefit also observed in the sub-group who did not use ENF *de novo*
- The time to a new ADE or death was significantly prolonged for patients receiving ETR + BR compared with placebo + BR
- Significantly fewer cumulative hospital days occurred in patients receiving ETR + BR than in the placebo + BR group (p=0.0195)
- These results add to the previously demonstrated significant benefit of ETR in achieving HIV RNA suppression and augmenting CD4 cell count recovery
- The clinical endpoint data validates and expands the surrogate marker data by demonstrating a reduction in HIV clinical disease progression when ETR is added to DRV/r + BR

DUET study design and major inclusion criteria

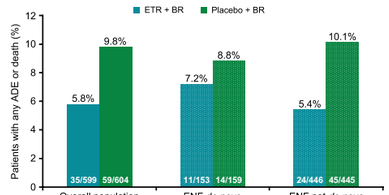


*BR = DRV/r, optimized NRTIs and optional ENF

- Major inclusion criteria
  - plasma viral load >5000 copies/mL and stable therapy for ≥8 weeks
  - ≥1 NNRTI RAM, at screening or in documented historic genotype
  - ≥3 primary PI mutations at screening
- DUET-1 and DUET-2 differ only in geographic location
- Pooled analysis was prespecified

DRV/r = darunavir with low-dose ritonavir
RAM = resistance-associated mutation; PI = protease inhibitor

Proportion of patients with any ADE or death



*p values derived from logistic regression model with factors treatment, trial, baseline viral load, ENF use and interaction between treatment and ENF

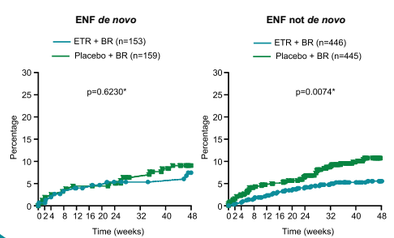
Most commonly reported confirmed or probable ADE*

Parameter, n (%)	Pooled DUET overall		Pooled DUET ENF *de novo*		Pooled DUET ENF not *de novo*	
	ETR + BR (n=599)	Placebo + BR (n=604)	ETR + BR (n=153)	Placebo + BR (n=159)	ETR + BR (n=446)	Placebo + BR (n=445)
Any confirmed or probable ADE	27 (4.5)	51 (8.4)	7 (4.6)	12 (7.5)	20 (4.5)	39 (8.8)
Death as a first event	8 (1.3)	7 (1.2)	4 (2.6)	2 (1.3)	4 (0.9)	5 (1.1)
Candida esophagitis	1 (0.2)	9 (1.5)	1 (0.7)	1 (0.6)	0	8 (1.8)
Pneumocystis jiroveci pneumonia	3 (0.5)	6 (1.0)	1 (0.7)	2 (1.3)	2 (0.4)	4 (0.9)
HSV	4 (0.7)	4 (0.7)	0	2 (1.3)	4 (0.9)	2 (0.4)
MAC	2 (0.3)	5 (0.8)	0	1 (0.6)	2 (0.4)	4 (0.9)
CMV retinitis	1 (0.2)	5 (0.8)	0	0	1 (0.2)	5 (1.1)
KS	2 (0.3)	4 (0.7)	1 (0.7)	0	1 (0.2)	4 (0.9)

Other commonly reported ADE (in ≥2 patients in the ETR + BR or placebo + BR group) included gastroenteritis cryptosporidial, meningitis cryptococcal, HIV wasting syndrome, pneumonia bacterial and non-Hodgkin's lymphoma

*In ≥6 patients in the pooled overall ETR + BR and placebo + BR groups

Time to first confirmed/probable ADE or death: ENF subgroups



*p values derived from log-rank test

Acknowledgments

We express our gratitude to the patients who participated in the studies, as well as the study center staff, the data safety and monitoring board, clinical event adjudication panels, Virco, Tibotec personnel and the following principal investigators.
DUET-1: Argentina: HA Ariza, J Benetucci, LM Calanni, LI Cassetti, J Corral, DO David, A Krolewiecki, MH Losso, P Patterson, RA Tejerino; **Brazil**: CA da Cunha, B Grinsztejn, EG Kallas, JV Madruga, EM Netto, JH Pilotta, M Schechter, J Suleiman, A Timerman; **Chile**: J Ballesteros, R Northland; **Costa Rica**: AA Alvilés Montoya, G Herrera Martinez, A Solano Chinchilla; **France**: M Dupon, C Katlama, JM Livrozet, P Morlat, G Pialoux, C Piketty, I Poizot-Martin; **Mexico**: J Andrade-Villanueva, G Reyes-Terán, J Sierra-Madero; **Panama**: A Canton, A Rodriguez, N Sosa; **Puerto Rico**: JO Morales Ramirez, JL Santana Bagur, R Soto-Malave; **Thailand**: T Anekthananon, P Mootsikapun, K Ruxrungtham; **USA**: M Albrecht, N Bellos, R Bolan, P Brachman, C Brinson, F Cruickshank, R Elion, WJ Fessel, R Haubrich, T Hawkins, S Hodder, P Hutcherson, T Jefferson, H Katnes, C Kinder, M Kozal, J Lalezari, J Leider, D McDonough, A Mills, K Mounzer, J Nadler, D Norris, W O'Brien, G Pierone, K Raben, B Rashbaum, M Rawlings, B Rodwick, P Ruane, J Sampson, S Schrader, A Scribner, M Sension, D Sweet, B Wade, D Wheeler, A Wilkin, T Wilkin, T Wills, M Wohlfeiler, K Workowski.
DUET-2: Australia: J Chuah, D Cooper, B Eu, J Hoy, C Workman; **Belgium**: N Clumeck, R Colebunders, M Moutschen; **Canada**: J Gill, K Gough, P Junod, D Kilby, J Montaner, A Rachlis, B Trottier, CM Tsoukas, S Walmsley; **France**: C Anvieux, L Cotte, JF Delfraissy, C Katlama, PM Girard, B Marchou, D Vittecoq, Y Yazdanpanah, P Yeni; **Germany**: K Arasteh, S Esser, G Fätkenheuer, H Gellermann, K Göbels, FD Goebel, H Jäger, JK Rockstroh, D Schuster, S Staszewski, A Stoehr; **Italy**: A Antinori, G Carosi, G Di Perri, R Esposito, A Lazzarin, F Mazzotta, G Pagano, E Raise, S Rusconi, L Sighinolfi, F Suter; **The Netherlands**: PHJ Frissen, JM Prins, BJA Rijnders; **Poland**: A Horban; **Portugal**: F Antunes, M Miranda, J Vera; **Spain**: P Domingo, B Clotet, G Garcia, JM Gatell, J Gonzalez-Lahoz, J López-Aldeguer, D Podzamczer; **UK**: P Easterbrook, M Fisher, M Johnson, C Orkin, E Wilkins; **USA**: B Barnett, J Baxter, G Beatty, D Berger, C Borkert, T Campbell, C Cohen, M Conant, J Ernst, C Farthing, T File, M Frank, JE Gallant, AE Greenberg, C Hicks, DT Jayaweera, S Kerkar, N Markowitz, C Martorell, C McDonald, D McMahon, M Mogyoros, RA Myers Jr, G Richmond, K Sathasivam, S Schneider, H Schrager, P Shalit, FP Siegal, L Sloan, K Smith, S Smith, P Tebas, LS Tkatch.