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Real World Virologic Outcomes of Cabotegravir/Rilpivirine in Patients with Elevated Body Mass Index

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BACKGROUND

- Limited data are available regarding risk factors for confirmed virologic failure (CVF) while on cabotegravir/rilpivirine (CAB/RPV) (defined as two subsequent HIV RNAs ≥ 200 copies/mL) given low occurrence rate across three randomized controlled trials.[1-3]
- CAB/RPV is administered via ventrogluteal or dorsogluteal injection and surpassing adipose tissue to reach muscle is imperative. Individuals with higher body mass indexes (BMIs) were not well represented in the aforementioned studies; only 59 individuals with BMI ≥ 30 kg/m^2 received every 8 week CAB/RPV injections.[2]
- The prevalence of obesity has increased in persons living with HIV.[4] A higher BMI has been significantly associated with CVF in patients on CAB/RPV when other risk factors for CVF are present.[5]
- Our study aims to provide additional data on use of CAB/RPV in elevated BMIs and provide context for its use in a real world setting.

METHODS

- This study is a multi-center, retrospective cohort study evaluating patients on injectable CAB/RPV between January 20, 2021 and February 15, 2023.
- Primary outcome: Incidence proportion of individuals with a HIV RNA ≥ 50 copies/mL at last observed endpoint in those with and without BMI ≥ 30 kg/m^2
- Secondary outcomes: Incidence proportion of CVF defined as two consecutive HIV RNA ≥ 200 copies/mL

Table 1: Inclusion and Exclusion Criteria

Inclusion Criteria	Exclusion Criteria
• 18 years or older • Received at least one injection of CAB/RPV • HIV RNA result available at follow up visit after starting injectable CAB/RPV • HIV RNA <50 copies/mL prior to CAB/RPV initiation	• No weight available within 90 days prior to CAB/RPV initiation

There is no difference in incidence of HIV RNA ≥ 50 copies/mL at last observed endpoint in patients receiving CAB/RPV with a BMI ≥30 kg/m^2 versus those with BMI <30 kg/m^2.

RESULTS

Table 2: Characteristics of Study Population Stratified by BMI

	BMI <30 (n=226)	BMI ≥ 30 (n=148)	Overall (N=374)	SMD
Median Age, yrs [Min, Max]	39.5 [21.0, 75.0]	42.0 [23.0, 70.0]	41.0 [21.0, 75.0]	0.07
Male Sex at Birth (%)	180 (79.6)	100 (67.6)	280 (74.9)	0.28
Mean Weight at baseline, kg (SD)	75.8 (12.8)	111 (19.6)	89.5 (23.2)	2.10
Mean Baseline CD4, cells/mm^3 (SD)	683 (300)	776 (349)	720 (323)	0.29
Gluteal Implants (%)	2 (0.9)	2 (1.4)	4 (1.1)	0.04
Cigarettes/ Vape Use (%)	100 (44.2)	51 (34.5)	151 (40.4)	0.20
Baseline BMI, kg/m^2 (%)	226 (100)	-	226 (60.4)	17.15
• 30 - 34.9	-	70 (47.3)	70 (18.7)	
• 35 - 39.9	-	43 (29.1)	43 (11.5)	
• 40 - 44.9	-	18 (12.2)	18 (4.8)	
• 45 - 49.9	-	11 (7.4)	11 (2.9)	
• >50	-	5 (3.4)	5 (1.3)	

SMD: standard mean deviation; SD: standard deviation

- Overall 5% of individuals had a history of CVF and 47% had NNRTI exposure prior to CAB/RPV initiation.
- All individuals included in the study had been on CAB/RPV for a median of 255 days (IQR 147-362) at conclusion of the study.
- Most patients (68%) were on a Q8 week regimen while 27% had been on both Q4 and Q8 week regimens.
- There was no difference in incidence of HIV RNA ≥ 50 copies/mL at last observed endpoint for those with BMI ≥30 kg/m^2 (12%) versus those with BMI <30 kg/m^2 (9%) (IRR 1.31; 95% CI 0.69-2.46).
- CVF rates on CAB/RPV were low in both groups with a total of four CVFs in the entire study, which was 1.1% of the study population. Of these, half had a BMI ≥30 kg/m^2.

Figure 1: Incidence of HIV RNA ≥50 copies/mL and Confirmed Virologic Failure

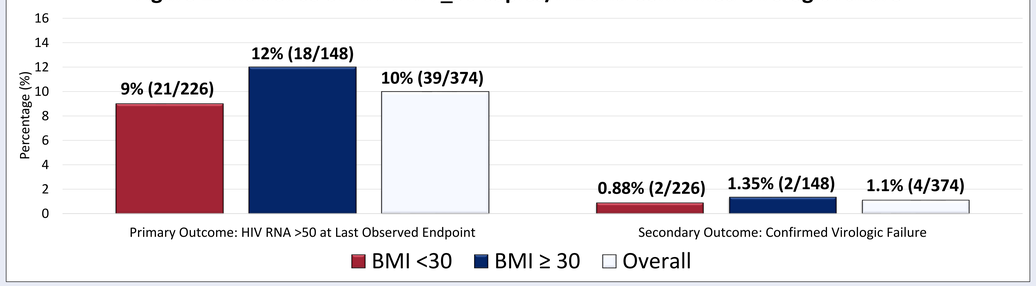


Table 3: Subject Characteristics for those with CVF

Variables	Subjects with CVF 1	2	3	4
Sex at Birth	Male	Male	Male	Male
Injections on Time	Y	N	Y	Y
Time Since Diagnosis to CAB/RPV Start	21 months	15 years	18 months	2 years
Gluteal Implants	Y	N	N	N
Cigarette/Vape	N	N	Y	Y
BMI (kg/m^2)	33.5	29.7	25.6	32.5
NNRTI Exposure	Y	Y	N	N
Resistance History	K103E, K103Q, V179I, M50I	N	N	N
Regimen	Q4	Q8	Q8	Q8
Needle Length	1.5”	1.5”	1.5”	1.5”
Days to CVF	85	216	189	287
Resistance Found	Unable to get genotype	Y188L, Q148R	N	K101E, N155H, R263K, I178M

HIV subtype was only available for two individuals (subtype B).

DISCUSSION AND CONCLUSIONS

- CVF occurred in four individuals on CAB/RPV. Two of the four had BMI 30-35 kg/m^2. There were 77 individuals with BMI ≥35 kg/m^2, none of whom experienced CVF.
- CVF occurred at median time of 186 days, which is similar to time to CVF reported in randomized controlled trials (175 days).[1-3]
- Risk factors for CVF were previously defined as having two of the following: preexisting RPV mutations, HIV subtype A6/A1, or elevated BMI. Only 1 patient in our study with CVF had two previously defined risk factors for CVF.[5]
- Our study provides real world data regarding use of CAB/RPV in elevated BMIs. This is the largest collection of patients with elevated BMI on an every 8 week regimen and more specifically, those with BMI ≥ 40 kg/m^2 to date.

ADDITIONAL KEY INFORMATION

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Acknowledgements: Amy Graziani, Antoneta Karaj, Gabrielle Gionet, Alisa Stephens, Jillian Baron, Rasheed Siddiqui, Christina Patton