

Objectives

- To identify predictors of DNR status in critically ill HIV-infected patients admitted to ICU in the cART era

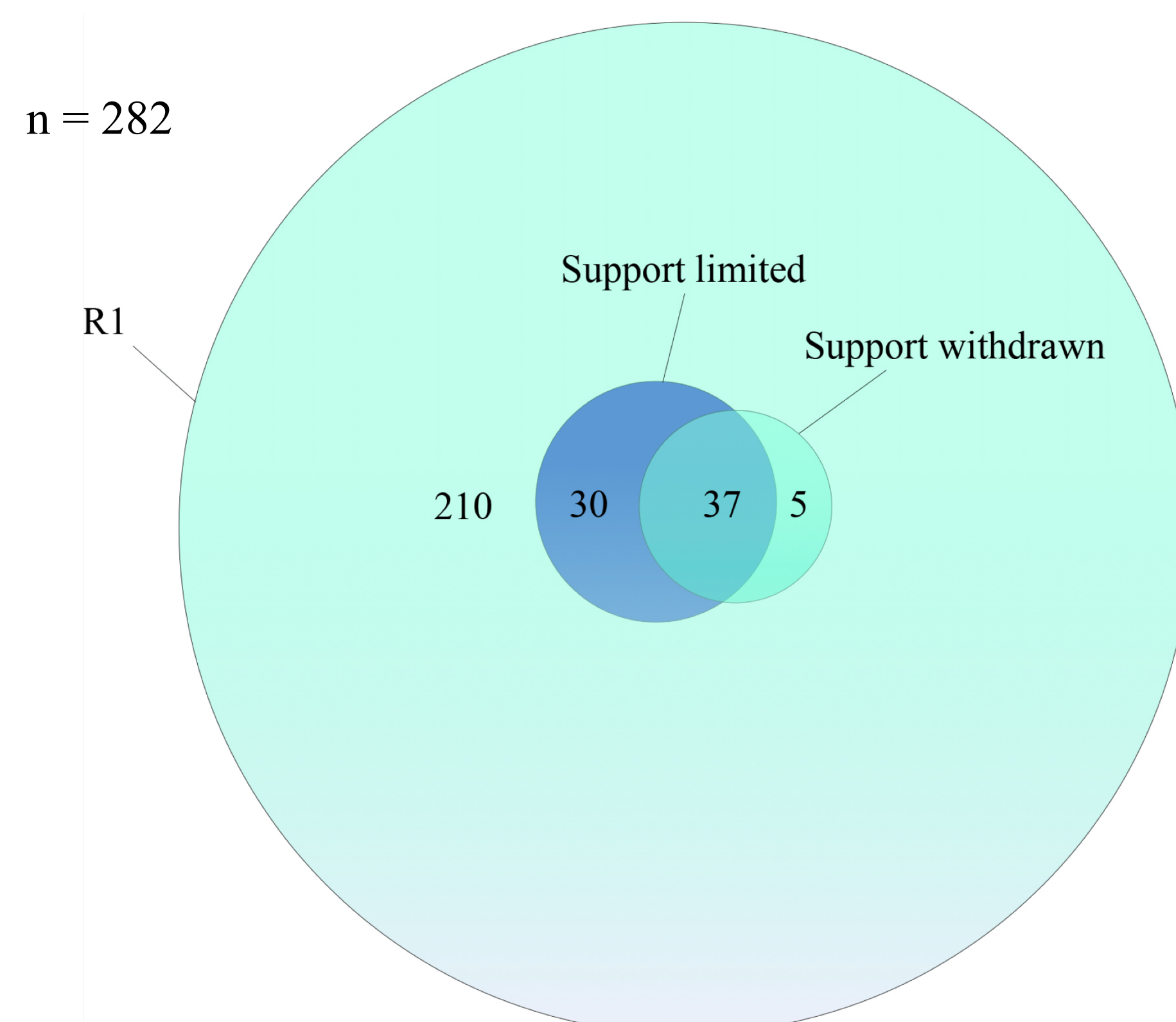
Hypotheses

- Higher APACHE II score will be associated with limitations of support/DNR status
- Markers of HIV severity will be associated with limitations of support

Methods

- Retrospective cohort study
- All first-time ICU admissions of HIV-infected patients to five hospital ICUs in Edmonton, Canada
- July 2002 to July 2014
- Data collected: demographics, comorbidities, markers of HIV severity and control, admission diagnosis, illness severity, organ failure, DNR status and support withdrawal
- Each discrete ICU admission analyzed represents a single patient and a single hospitalization. Multiple ICU admissions during a single hospitalization or transfers between ICUs because of bed limitations were combined and analyzed as a single admission
- Univariate analysis: Chi-square or Fisher's exact tests for categorical variables, *t*-tests or Mann Whitney *U* tests for continuous variables
- Multivariable analysis (Cox proportional hazards regression) to identify variables independently associated with support limitation

Study Population



Results

Table 1: Baseline characteristics and univariate analyses - support limitations

	All patients n=282 (100%)	No n=215 (76%)	Yes n=67 (24%)	p-value (Chi-square)
Age in years (mean, SD)	44.2 (9.9)	44.1 (10.0)	44.4 (9.2)	0.82
Male gender	169 (59.9)	131 (60.9)	38 (56.7)	0.54
Ethnicity				0.95
Aboriginal	134 (47.5)	103 (47.9)	31 (46.3)	0.82
Caucasian	115 (40.8)	88 (40.9)	27 (40.3)	0.93
Black	17 (6.0)	12 (5.6)	5 (7.5)	0.57
Other/unknown	16 (5.7)	12 (5.6)	4 (6.0)	0.90
Hospital site				0.154
Comorbidities				
HCV coinfection [^]	153 (54.4)	113 (52.8)	40 (59.7)	0.32
HBV coinfection [^]	17 (6.0)	12 (5.6)	5 (7.6)	0.55
Chronic lung dz	57 (20.2)	38 (17.7)	19 (28.4)	0.057
Malignancy	21 (7.4)	14 (6.5)	7 (10.4)	0.28
Psychiatric disease	68 (24.1)	56 (26.0)	12 (17.9)	0.17
Cirrhosis	37 (13.1)	28 (13.0)	9 (13.4)	0.93
CAD	10 (3.5)	5 (2.3)	5 (7.5)	0.047
Addiction	184 (65.2)	142 (66)	42 (63)	0.61
HIV risk factor				
IDU	169 (59.9)	130 (60.5)	39 (58.2)	0.74
Gay	27 (9.6)	17 (7.9)	10 (14.9)	0.088
Heterosexual	186 (66.0)	140 (65.1)	46 (68.7)	0.593
New diagnosis of HIV	45 (16.0)	41 (19.1)	4 (6.0)	0.011
Durn HIV (yrs, mean, SD) [^]	6.0 (5.6)	5.6 (5.5)	7.1 (5.5)	0.067
ARVs at ICU admission	98 (34.8)	72 (33.5)	26 (38.8)	0.43
CD4 count in cells/mm ³ (median, IQR) [^]	125 (30-300)	130 (40-313)	105 (20-283)	0.23
CD4 percentage (median, IQR) [^]	15 (6-25)	15 (7-25)	11 (3-25)	0.09
HIV viral load in copies/mL (median, IQR) [^]	28000 (110-270000)	32500 (110-278432)	8200 (56-235000)	0.59
CD4 categories [^]				0.36
<50	80 (29)	57 (27)	23 (35)	
50-200	87 (31)	71 (33)	16 (24)	
>200	113 (40)	86 (40)	27 (41)	
HIV viral load suppressed [^]	78 (28.4)	60 (28.6)	18 (27.7)	0.89
History of OI	90 (31.9)	62 (28.8)	28 (41.8)	0.047
Admission diagnosis				0.026
Respiratory failure	10 (3.5)	6 (2.8)	4 (6.0)	0.22
Sepsis	189 (63.8)	133 (61.9)	47 (70.1)	0.22
Trauma	23 (8.2)	23 (10.7)	0 (0)	0.25
Overdose	32 (11.3)	27 (12.6)	5 (7.5)	0.005
APACHE II score (mean, SD)	22.1 (7.8)	20.5 (7.0)	27.2 (8.0)	0.000
LDH (median, IQR) [^]	292 (187-471)	288 (176-463)	324 (225-555)	0.22
Albumin (mean, SD) [^]	24.3 (7.2)	24.8 (7.3)	22.9 (6.8)	0.06
IMV	213 (75.5)	157 (73)	56 (83.6)	0.079
Shock	133 (47.2)	91 (42.3)	42 (62.7)	0.004
AKI/RRT	35 (12.4)	21 (9.8)	14 (20.9)	0.016
Ventilator days (median, IQR)	3 (1-7)	3 (1-6)	4 (1-10)	0.01
30-day mortality	55 (19.5)	13 (6.0)	42 (63)	0.000

Legend: [^]missing data; bold, p-value <0.1

Results – Multivariable analysis

Table 2: Multivariable Logistic Regression for Limitations of Care

	OR	95% CI	p-value
APACHE II	1.13	1.08 – 1.19	< 0.001
History of OIs	2.59	1.21 – 5.56	0.015
CAD	5.72	1.18 – 27.76	0.031
Duration of HIV (yrs)	1.07	1.01 – 1.14	0.025

Adjusted for APACHE II, male sex, age, HIV VL, history of OI, MSM, CAD, chronic lung disease, admission diagnosis, IMV, shock, AKI/RRT, duration of HIV, CD4 count

Conclusions

- This critically ill HIV-infected population is young
- Comorbidities, particularly polysubstance use, viral coinfection, and psychiatric disease are common
- Approximately 25% of critically ill HIV-infected patients had new DNR status during ICU admission
- Predictors of DNR status:
 - Illness severity (APACHE II)
 - CAD
 - Prior opportunistic infection
 - Duration of HIV infection

References

- Corona A, Raimondi . Critical care of HIV-infected patients: still a dilemma for Italian intensivists – results of a multicentre survey. *EJA*. 2010;27(4):377-382.
- Souza PN, Miranda EJ, Cruz R, Forte DN. Palliative care for patients with HIV/AIDS admitted to intensive care units. *Rev Bras Ter Intensiva*. 2016;28(3):301-309.
- Sweeney DA, Akrami K, Malhotra A. Improved outcomes in critically ill patients with AIDS: how does this trend continue? *Crit Care Med*. 2016;44(2):446-447.

Acknowledgements

No conflicts of interest. Northern Alberta Program (director Dr. Stan Houston) for use of HIV database. CCM Program (David McKinlay) and Alberta Health Services (AHS) for use of Minimal DataSet database and eCritical TRACER data. AHS health records staff for operational support. Contact sturvey@ualberta.ca for more information.