

Outcome of ANCA-associated vasculitis patients with active disease admitted to the ICU: A comparative multicenter study

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OBJECTIVES&METHODS

Data concerning AAV patients requiring ICU cares are scarce. The objective of the present study was to analyse:

- the disease presentation of AAV patients admitted to the ICU with acute vasculitis manifestations.
- the long-term outcome of AAV patients that required ICU cares.

This multicenter retrospective study included consecutive patients admitted to 18 ICUs between 2002 and 2012 (**ICU group**). Inclusion criteria were: age > 18 years, newly diagnosed or relapsing AAV, ANCA positivity by IIF and ELISA (PR3 or MPO), AAV diagnosis done during the ICU stay or within the thirty days preceding ICU admission.

A control population of AAV patients that did not required ICU was used as a control group (**non-ICU group**). This group included consecutive AAV patients from 2 nephrology centers (Angers and Tours Nephrology departments) admitted with active AAV. Patients that required ICU admission within the month following admission to the nephrology department were excluded from the control group.

RESULTS

Baseline characteristics.

97 and 95 patients were included in the ICU and non-ICU groups, with 2.9±2.9 and 4.8±3.7 years, respectively. Patients characteristics at presentation are summarized in **table 1**. BVAS was comparable between groups. Heart, lung and central neurological involvements were more frequent in ICU-AAV patients as compared to non-ICU patients. ICU AAV patients had predominantly c-/PR3-ANCA, while non-ICU patients had predominantly p-/MPO-ANCA. Induction regimen with steroid+CYC and steroid+CYC+PE were used in 42.3 and 43.3% of ICU patients and 58.9 and 23.2% of non-ICU patients, respectively.

Parameters specific to ICU AAV group, organ support and predictors of ICU mortality.

The mean length of ICU stay was 16±27 days. Acute respiratory failure, alone or with combination with renal failure were the main cause of ICU admission (80%). Respiratory assistance, RRT and vasopressors were used in 70, 57 and 27% of patients respectively.

An infectious event occurred during the ICU stay in 40% of patients. 15 (15.5%) patients died in the ICU, the 90 days mortality was 18.6%. Causes of death were attributed to vasculitis manifestations (40%; DAH, n=5; digestive involvement, n=1), sepsis (33%, n=5) and neurologic failure (27%, n=4).

Respiratory assistance, vasopressor use, infectious events, SAPSII and SOFA were significantly associated with ICU mortality in the univariate analysis. In the multivariate analysis, only infectious events (OR 20.5, p=0.005) and SAPSII (OR 1.10, p=0.009) remained significantly associated with death.

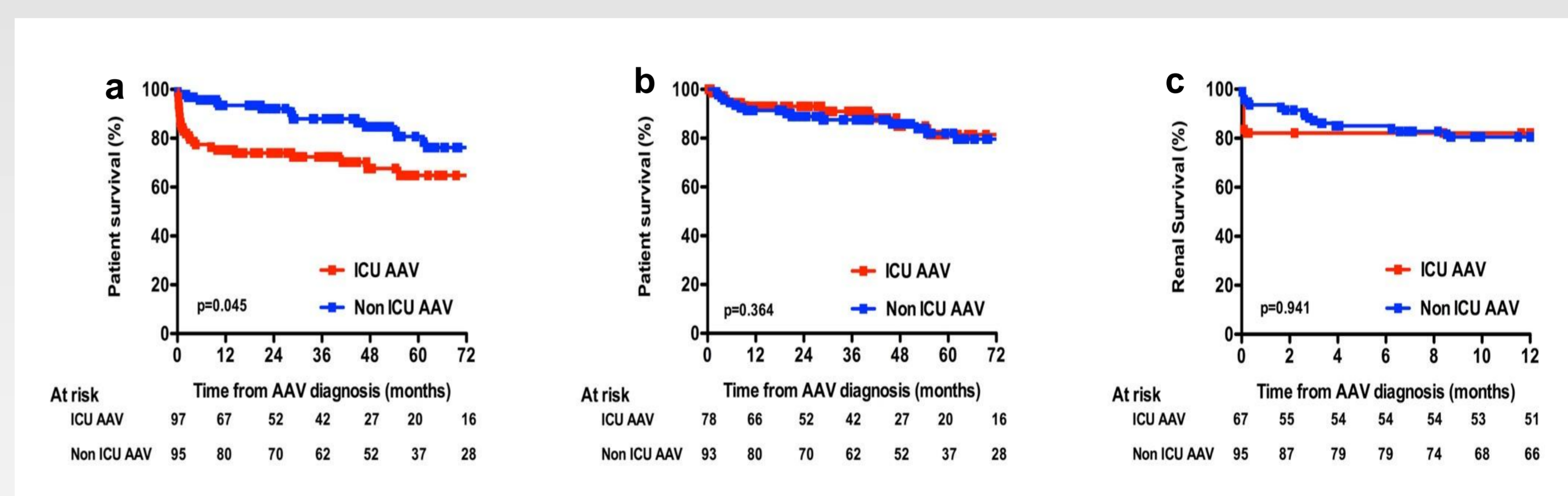
Long term outcome of ICU-AAV patients.

As compared to non-ICU, ICU-AAV patients had a poorer survival (**Fig 1a**). However, when analysis focussed on patients that survived to the first hospital stay, long term survival was no longer different between ICU and non-ICU patients (**Fig 1b**). Moreover, the renal survival was not significantly different between ICU and non-ICU patients (**Fig 1c**).

Table 1. Baseline characteristics of the ICU and non-ICU AAV groups

	ICU AAV (n=97)	Non ICU AAV (n=95)	P
Baseline characteristics			
Sex (M/F)	45/52	54/41	0.147
Age (years)	59.2 ± 16.1	64.5 ± 14.5	0.016
Weight (kg)	70.0 ± 16.9	71.1 ± 15.1	0.688
Hypertension, n (%)	35 (36.1)	47 (49.5)	0.061
Diabetes mellitus, n (%)	11 (11.3)	9 (9.5)	0.672
AAV characteristics			
Diagnosis, n (%)			
GPA	58 (59.8)	45 (47.4)	0.084
MPA	37 (38.1)	48 (50.5)	0.084
EGPA	2 (2.1)	2 (2.1)	0.983
ANCA type			
by immunofluorescence			
cANCA / pANCA	61 (62.9) / 36 (37.1)	33 (34.7) / 62 (65.3)	<0.001
by ELISA			
PR3-ANCA / MPO-ANCA, n (%) / n (%)	60 (61.9) / 37 (38.1)	30 (31.6) / 65 (68.4)	<0.001
Disease status, n (%)			
Newly diagnosed / relapsing AAV, n (%) / n (%)	77 (79.4) / 20 (20.6)	88 (92.6) / 7 (7.4)	0.008
BVAS	23.0 ± 7.9	22.6 ± 9.7	0.739
Organ involvement, n (%)			
Cutaneous signs	25 (25.8)	19 (20.0)	0.341
Ear, nose, throat	36 (37.1)	34 (35.8)	0.849
Heart	17 (17.5)	3 (3.2)	0.001
Digestive	9 (9.3)	3 (3.2)	0.134
Lung	85 (87.6)	30 (31.6)	<0.001
Alveolar hemorrhage	62 (63.9)	9 (9.5)	<0.001
Others	23 (23.7)	21 (22.1)	0.791
Renal	83 (85.6)	87 (91.6)	0.191
Serum creatinine	347.5 ± 289	313.3 ± 392	0.417
Renal replacement therapy	55 (56.7)	19 (20.0)	<0.001
Neurological	25 (25.8)	12 (12.6)	0.020
Central	8 (8.2)	0 (0)	0.007
Peripheral	17 (17.5)	12 (12.6)	0.343

Figure 1. Survival of ICU and non-ICU-AAV patients (a), Survival of patients that survived to the first hospital stay (b), and Renal survival of ICU and non-ICU patients (c).



DISCUSSION&CONCLUSIONS

This study is the first to report the long term outcome of AAV patients with active disease after ICU stay and to assess the impact of such stay in comparison to AAV patients initially admitted to non-ICU wards. Besides observing that ICU admission is associated with poor outcome, we thought that the main question was to determine the association between initial severity, invasive therapeutics procedures and long term outcome. For this purpose, we analysed the outcome of survivors after the initial stay and observed that long term survival as well as renal survival were comparable between ICU and non-ICU AAV patients. Thus, our observation tends to show that the initial disease severity is not associated with adverse long term outcome. From an ICU point of view, this observation is at stake with several reports showing prolonged excess risk of death in ICU survivors as compared to non-ICU patients.

As a conclusion, DAH is the most common vasculitis manifestation leading AAV patients the ICU. Despite a high early ICU mortality, patients that survive to ICU show comparable long-term mortality and renal prognosis as compared to non-ICU AAV patients.

