ACR 2012
Updates on vasculitis

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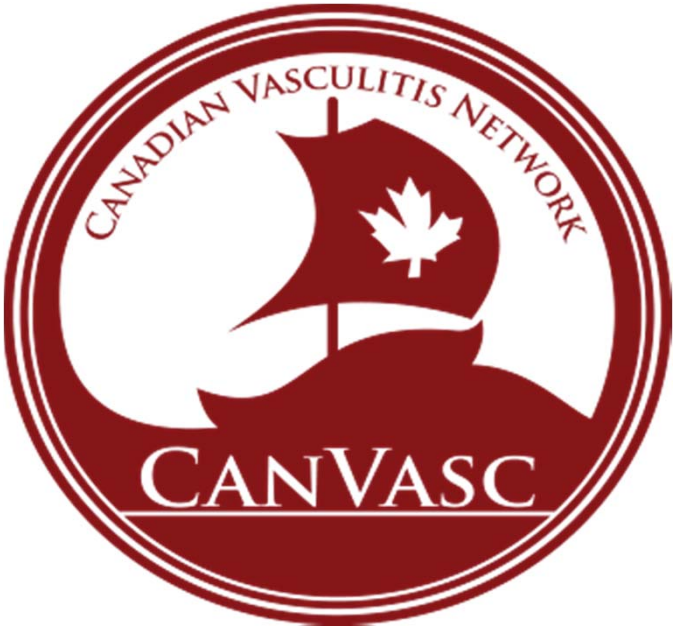


First, a gentle reminder…

2012 revised Chapel hill nomenclature

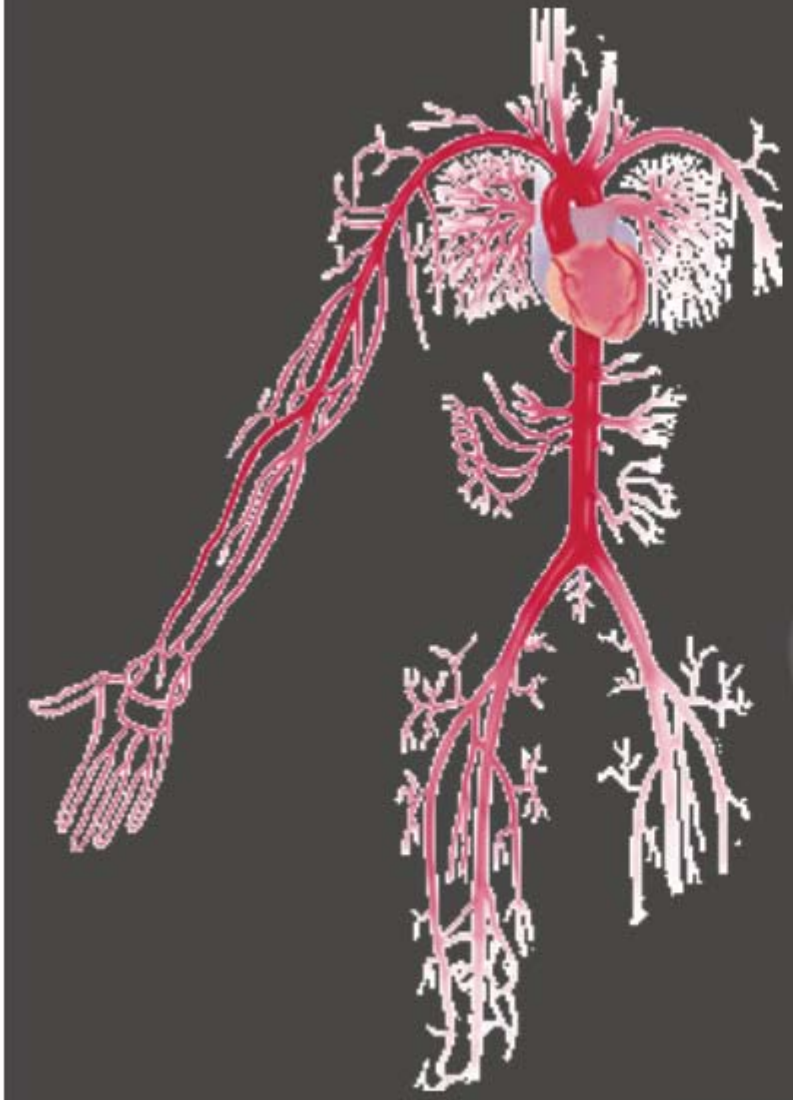
Jennette et al. Arthritis Rheum. 2012 Oct 8.

2012 revised Chapel hill nomenclature

- Variable Vessel Vasculitis (VVV): Behçet's Disease (BD) and Cogan's Syndrome (CS).
- Single Organ Vasculitis (SOV): Cutaneous Leukocytoclastic Angiitis, Cutaneous Arteritis, Primary CNS Vasculitis and Isolated Aortitis.
- Vasculitis Associated with Systemic Disease: Lupus Vasculitis, Rheumatoid Vasculitis and Sarcoid Vasculitis.
- Vasculitis Associated with Probable Etiology: Hepatitis C Virus-Associated Cryoglobulinemic Vasculitis, Hepatitis B Virus-Associated Vasculitis, Syphilis-Associated Aortitis, Serum Sickness-Associated Immune Complex Vasculitis, Drug-Associated Immune Complex Vasculitis, Drug-Associated ANCA-Associated Vasculitis and Cancer-Associated Vasculitis.

Jennette et al. Arthritis Rheum. 2012 Oct 8.

But don't forget



DCVAS

Diagnostic and Classification Criteria for Systemic Vasculitis

STUDY OVERVIEW

R. Luqmani

Large vessel vasculitides

ACR #855 (oral) - Sunday

Identification of a *Burkholderia-Like Strain* From Temporal Arteries of Subjects with GCA

Frozen paraffin-embedded TAB+ from GCA and controls
- DNA and RNA isolated → bacterial 16S rRNA analysis identified a genomic sequence within affected TAB 100% homologous to the genus Burkholderia
- Primers specific for Burkholderia in 9/10 GCA TAB vs 0/11 controls

Multilocus sequence typing (MLST, PCR-based) to type the organism as *B. pseudomallei-like* (BpGCA), with no type III secretion factors (TTSS3) = attenuated phenotype

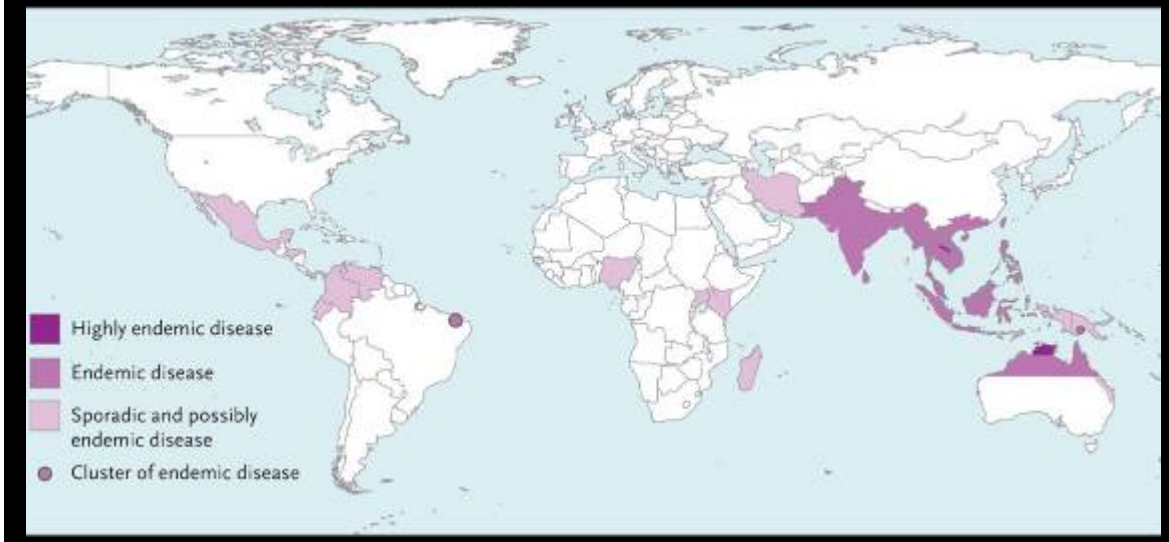
Burkholderia anti-LPS monoclonal Ab by IF and ELISA: detected BpGCA-LPS at high levels in GCA subject sera (n=61, mean 437.8 pg/ml, SEM 36.7) but not healthy controls (n=102, mean 28.1 pg/ml, SEM 3.8, $p<0.0001$)

Koening CL et al – Salt Lake City Veterans Administration

Review Article: Medical Progress

Melioidosis

W. Joost Wiersinga, M.D., Ph.D., Bart J. Currie, F.R.A.C.P., and Sharon J. Peacock, Ph.D.

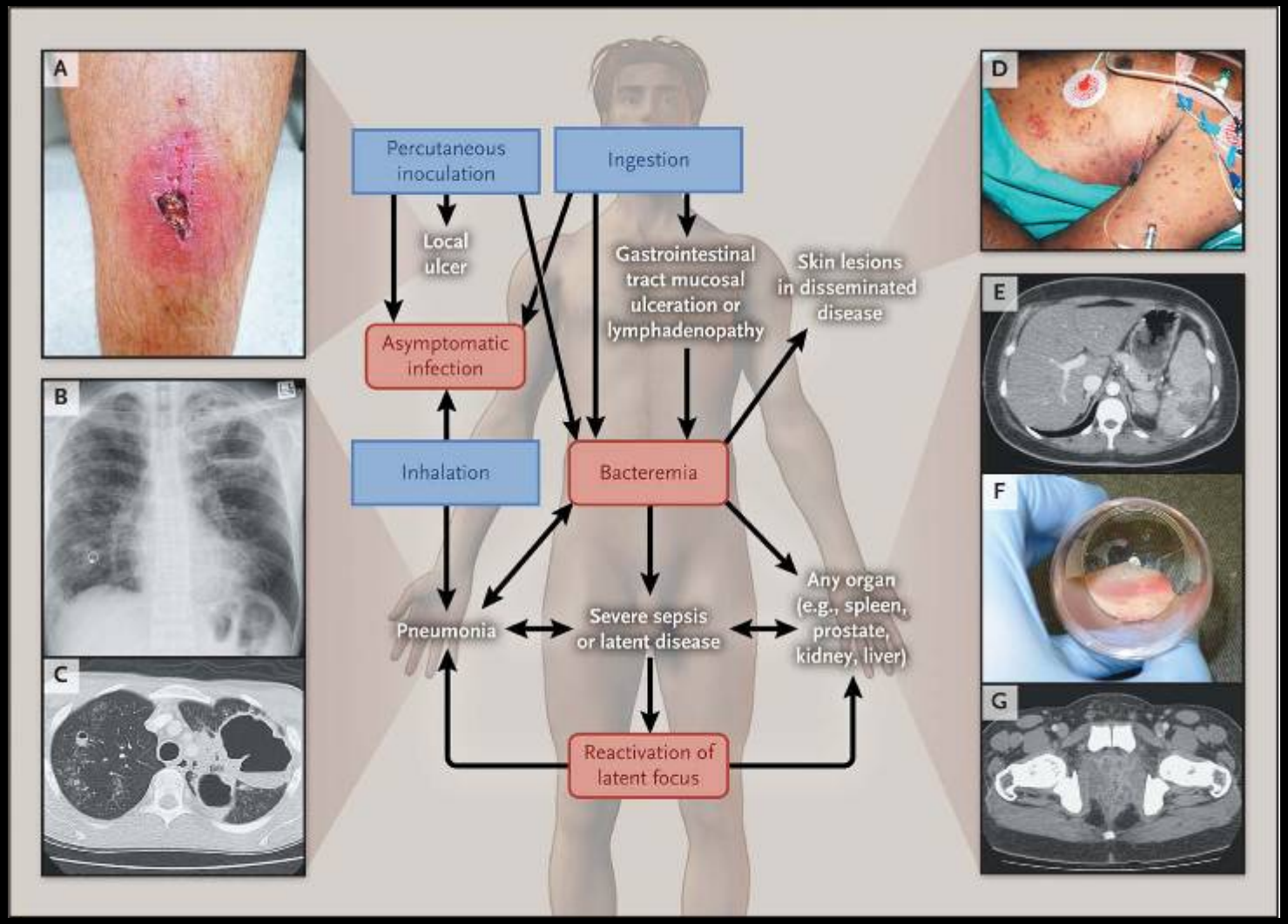


- primarily persons in regular contact with soil and water
- percutaneous inoculation (e.g., injury or open wound), inhalation (e.g., during severe weather), or ingestion (e.g., contaminated food or water)
- predominantly seasonal, 75 to 81% of cases during the rainy season
- Incidence peaks between 40 and 60 years of age

Adapted from N Engl J Med
Volume 367(11):1035-1044
September 13, 2012

The NEW ENGLAND JOURNAL of MEDICINE

Clinical Events after Infection with *B. pseudomallei*.



Wiersinga WJ et al. N Engl J Med 2012;367:1035-1044

ACR #855 (oral) - Sunday

Identification of a *Burkholderia-Like Strain* From Temporal Arteries of Subjects with GCA

Burkholderia cultured from a TAB of a GCA subject and the isolate was injected into C3H/HeSnJ mice, sacrificed and analyzed by light microscopy

Mice injected with the organism developed inflammation of pulmonary blood vessels

Koening CL et al – Salt Lake City Veterans Administration

ACR #2351 (poster) - Tuesday

Correlation Between Hypoechoic Halo of the Temporal Arteries and Clinical, Laboratory, and Temporal Artery Biopsy Findings in GCA

Retrospective analysis of 105 consecutive biopsy-proven GCA who underwent color-Doppler US (age 74±8 yr, females 72.4%).

HALO+ = hypoechoic halo >0.4 mm around the temporal artery lumen

→ Halo+ associated with jaw claudication (58.8% vs 25.9%; OR 4.1, [CI 1.8–9.3]), abnormalities of TA on clinical exam (67.3% vs 46,9; OR 2.3 [CI 1.0–5.3]), elevated ESR (91.5% vs 59.2%; OR 7.4 [CI 2.3–23.94]), and presence of giant cells on TAB (66.7% vs 29.4%; OR 4.8 [CI 2.0–11.4]), higher platelet count (396875±116274 vs 327954±103181)

→ BUT NO correlation with visual loss

Boiardi et al – Italy

ACR #2568 (oral) - Tuesday

The Risk of Pulmonary Embolism and Deep Vein Thrombosis in GCA: A Population-Based Cohort Study

Matched cohort study on BC database 01/1990-12/2007 for >18 y.o.
Recorded as GCA ≥2 visits, ≥ 40 y.o. and who received CS

10 controls/case, matched by year, sex and calendar year of exposure
RRs of PE and DVT adjusted for age, sex, comorbidities, trauma, fracture, surgery, and hospitalizations

1,175 individuals with GCA (74% F, mean age 75 y.o)
→ 22 PE and 24 DVT
→ RRs during the 1st yr
15.1 [95%CI, 6.6-36.2] for PE
5.9 [2.9-11.4] for DVT

	GCA	Non-GCA
PE		
Cases, N	22	65
Incidence Rate/1000 Person-Years	5.2	1.5
Age-, Sex-, Entry time Matched RR	3.6 [2.1 – 5.8]	1.0
Multivariable (adjusted RR)	3.1 [1.9-5.1]	1.0
DVT		
Cases, N	24	93
Incidence Rate/1000 Person-Years	5.8	2.1
Age-, Sex-, Entry time Matched RR	2.7 [1.7 – 4.3]	1.0
Multivariable RR (adjusted RR)	2.4 [1.5 –3.9]	1.0
PE or DVT		
Cases, N	36	142
Incidence Rate/1000 Person-Years	8.8	3.3
Age-, Sex-, Entry time Matched RR	2.7 [1.8 – 3.9]	1.0
Multivariable (adjusted RR)	2.4 [1.6 – 3.5]	1

Avina-Zubieta JA et al – ARCC/University of British Columbia

ACR #2357 (poster) - Tuesday

Relapses in Patients with GCA: Prevalence, Characteristics and Associated Clinical Findings in a Prospectively Followed Cohort of 106 Patients

Retrospective single center analysis of 106 biopsy-proven GCA and follow-up >4 years (between 1995 and 2007)

Relapses = reappearance of disease related symptoms with elevation of acute-phase reactants that required treatment adjustment
Strong inflammation = ≥3 of the following: fever >38°C, weight loss >5 kg, Hb <11 gr/L or ESR >85 mm/hr)

Follow-up 7.6 ± 3.3 yr
→66 (62%) patients with ≥1 relapse and 38 (36%) with ≥2
Mean time to 1st relapse was 72 ± 71 wk (11–339)

Relapses: PMR in 33 (50%), cranial symptoms in 19 (29%), systemic complaints in 13 (19.5%), cranial ischemic complications in 1 (1.5%)

No differences in clinical findings or blood test results at presentation but 23 (60.5%) of patients with ≥2 relapses had stronger inflammation vs only 5 (18%) and higher ESR and CRP at 6 months

Alba et al – Barcelona, Spain

ACR #2358 (poster) - Tuesday

Large Vessel Giant Cell Arteritis: A Cohort Study

A subset of patients with GCA has large vessel (LV) involvement
→ Comparison of GCA patients with radiographic subclavian LV-GCA to those biopsy-proven GCA with only cranial vessel involvement diagnosed between January 1999 and December 2008

120 LV-GCA (LV at diagnosis in 90, later in 30; 41/79 [52%] TBA+) vs 212 bpGCA

ACR classification criteria for GCA satisfied by 39.2% LV-GCA and 95.3% bpGCA

No differences in CV risk factors, sex and ESR/CRP between the 2 groups

56% of LV-GCA also had thoracic aorta involvement (thickening or aneurysm)

LV-GCA were younger (68.2 ± 7.5 years vs 75.7 ± 7.4), more likely to have a prior PMR (26% vs 15%), upper extremity claudication (52% vs 0%), Raynaud's (11% vs 0%), vascular bruits (38% vs 9%), abnormal pulse exam (60% vs 14%) and had longer duration of symptoms at Dx (3.5 vs 2.2 mo) but had less frequent cranial symptoms (41% vs 83%) and vision loss (4% vs 11%) compared with bpGCA

Median follow-up of 3.6 LV-GCA and 4.6 bpGCA years
Relapse rate higher (48.6 vs 29.8/100 person-yrs) and time to 1st relapse shorter (median 0.8 vs 1.2 yrs) for LV-GCA compared with bpGCA.

Time to CS discontinuation longer (median 4.5 vs 2.2 yrs) in LV-GCA
At 5 years of follow-up, higher rate of incident aortic aneurysm in LV-GCA (1.5% vs 0.3%) but similar rate of incident stroke

Muratore et al – Italy

ACR #2380 (poster) - Tuesday

High Frequency of Ferritin Autoantibodies in Takayasu Arteritis

In 2011, same group reported on autoAbs against human ferritin heavy chain protein (HFC) in sera of up to 92% of GCA and/or PMR patients

7 ELISAs with autoAg being the full recombinant HFC expressed by E. coli or 1/6 different peptides of HFC

Sera of 43 TAK patients, 36 SLE, 77 subjects >65yrs, 35 subjetcs with arteriosclerosis, 118 with fever (chronic infectious, malignant), 50 blood donors

→ Best results with ferritin peptides (combination of peptide 19–44A, 79–104A and 105–144A)

→ Ferritin peptide Abs in 27/43 (63%) in TAK

vs. 0/100 (0%) blood donors, 10/36 (28%) SLE, 7/77 (9%) age >65yrs, 4/35 (11%) arteriosclerosis, 24/118 (20%) fever patients

Helpful marker for TAK?

Baerlecken et al – Hanover, Germany

ACR #2368 (poster) - Tuesday

Tocilizumab in Refractory Takayasu's Arteritis: 7 Patients Followed At a Single Italian Centre

Retrospectively single center study on 7 refractory active TAK (all female, median age at TCZ onset 35 years, median duration of disease 66 mo [17–101]) treated with humanized anti-IL6R Ab TCZ (8 mg/kg monthly) between 2010 and 2012

Before TCZ, patients took a median of 4 [1–8] IS, 4 previously received anti-TNF
Median FU was 14 mo [9–24]

→ Average daily prednisone dose decreased 8.3 mg [5.9–29] to 8.0 mg [5.0–16] and could be reduced to <3 mg/day in 4
→ ESR decreased from 34 [8.0–76] to 4.0 [2.0–45] and CRP 13 [10–35] to 2.0 [1.0–44]
→ Median number of vascular lesions remained unchanged (improved in 1, did not progress in 1, worsening of at least one lesion in 5)
→ 2 had no signs or symptoms but 3 met NIH criteria of active disease
→ TCZ stopped in 4 because of suboptimal disease control

SAE: 1 pneumonia requiring TCZ stop, 1 relapsing URIs, 1 pytiriasis rosea that subsided after TCZ cessation

TCZ efficacious in only a minority... more severe disease here?
ESR and CRP do not correlate with disease activity during TCZ therapy

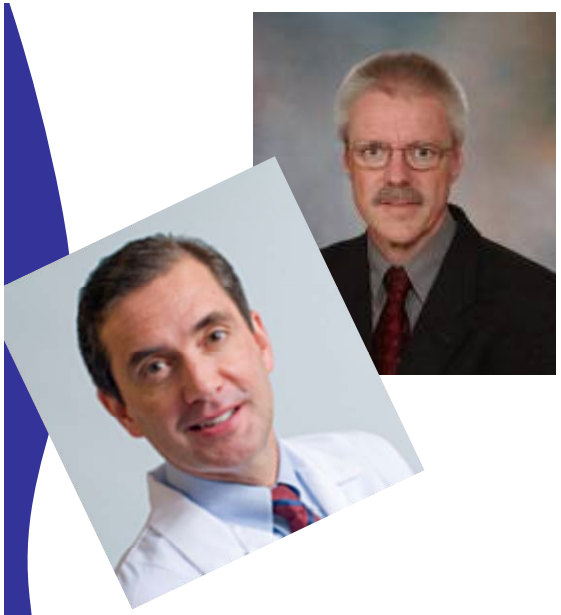
Tombetti et al – Milan, Italy

Medium vessel vasculitides

Small vessel vasculitides

ANCA-associated vasculitides

http://www.roi-leon.com/fr



RAVE

(<350 µM)
(no severe AH)
ANCA+

1 à 3 MP pulse(s)

CS + **oral CYC** * 3 to 6 mo

+ placebo RTX

Rituximab** **+ CS**

+ placebo CYC

AZA → M18

Placebo AZA

* oral CYC 2 mg/kg/d

** **RTX 375 mg/m2 x 4**

ACR #1654 (oral) - Monday

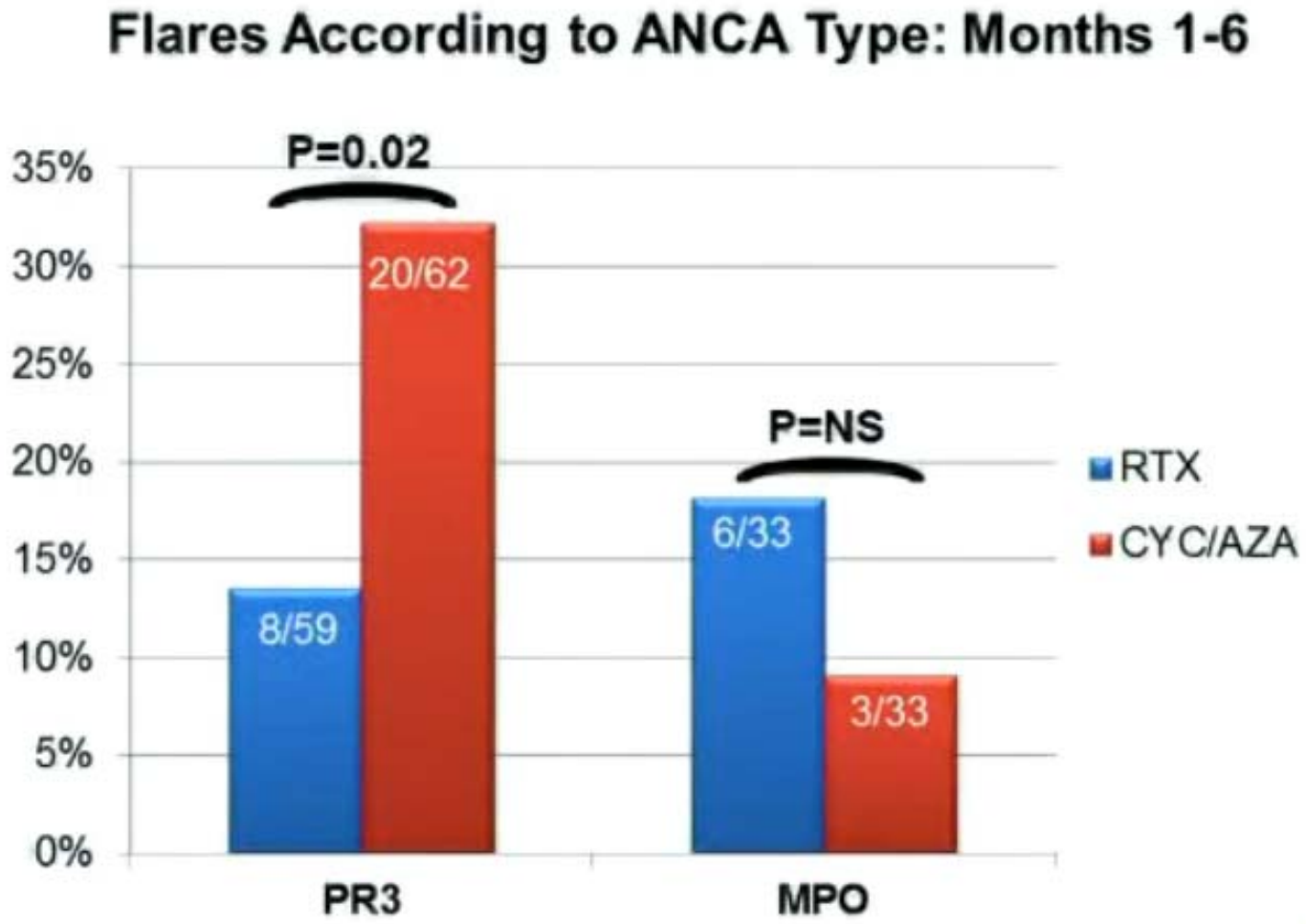
Primary Endpoint Failure in the RAVE Trial

82/197 (42%) PEF: 36 (36%) in RTX vs. 46 (47%) in CYC/AZA (p=0.09)

	RTX	CYC/AZA	P
Treatment failure	7 4 GN, 3 AH (1 died)	2 1 GN, 1 AH	0.17
Flares	15 4 severe, 11 minor	23 9 severe, 14 minor	NS 0.16, 0.53
AE → d/c	3	9	0.08
BVAS/WG>0	2	4	0.45
PDN dose >0mg OD	7	4	0.54
Other	2	4	0.45

Miloslavski E, Speck U, Stone JH et al – RAVE/ITN Research Group, Bethesda

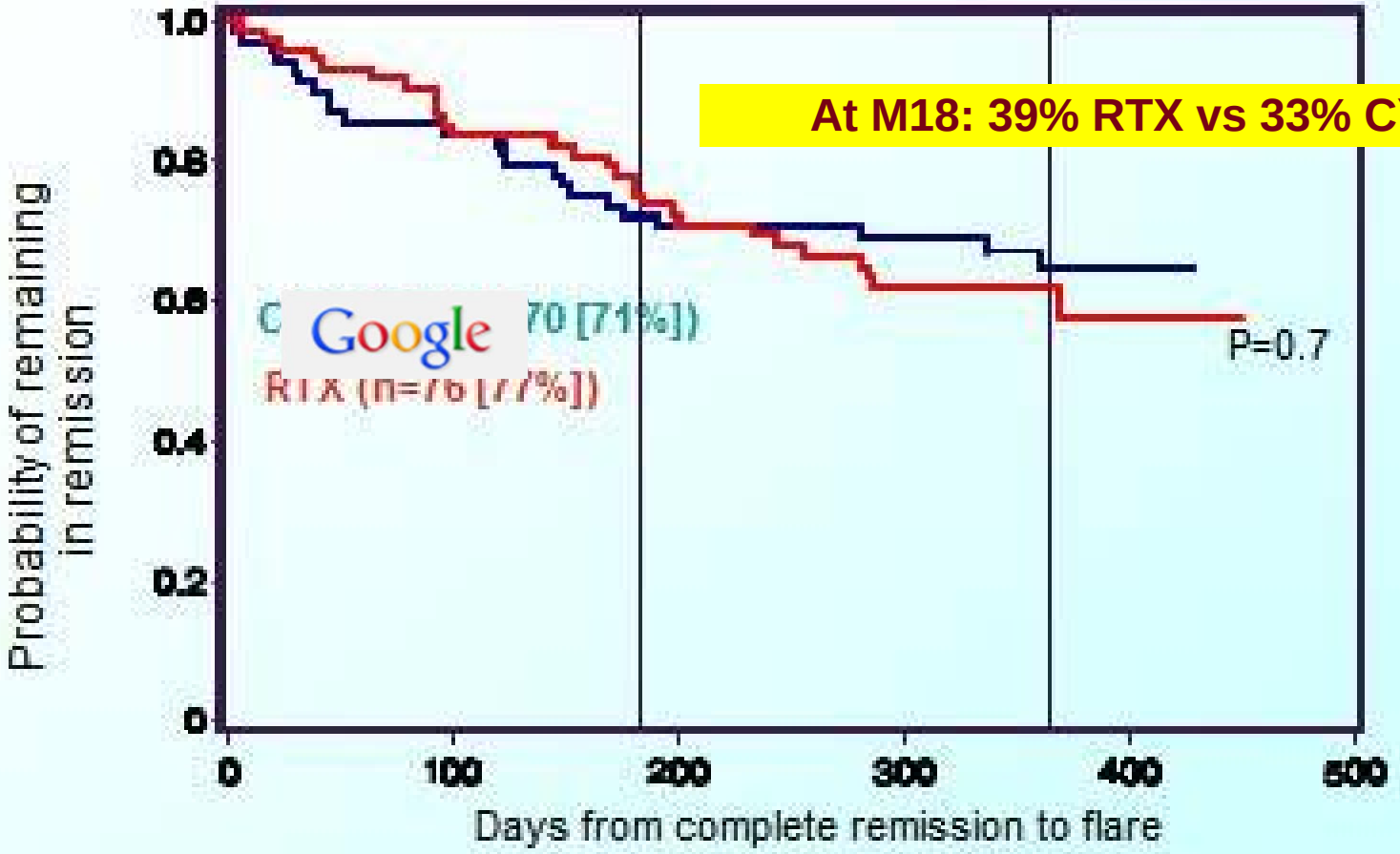
PR3-ANCA positive subjects flared more frequently if randomized to CYC/AZA



Immune Tolerance Network

Duration of Complete Remission by Treatment Group

(n = 146 of 197; 74%)



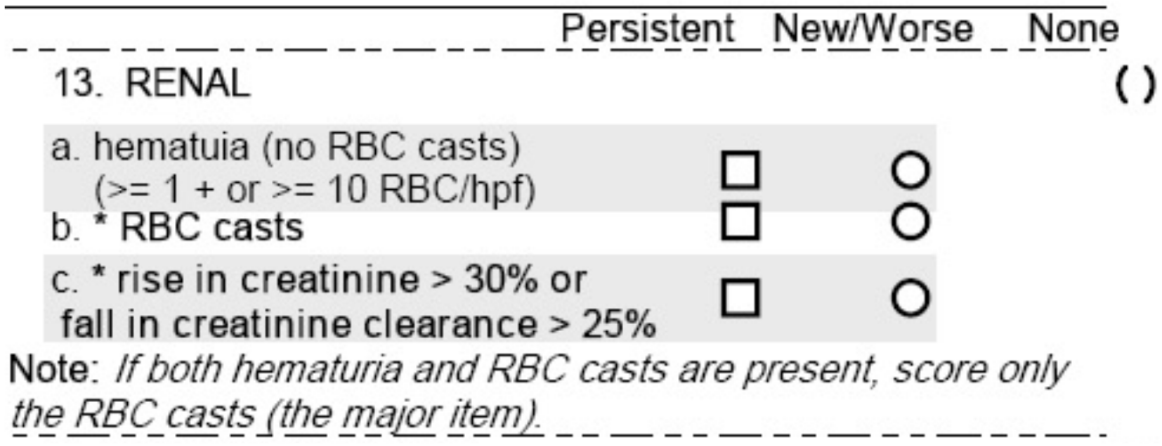
No statistically significant difference in limited or severe flares by 18 months

Stone JH et al. EULAR, London, UK- May 2011 - Courtesy of Dr. Paul Brunetta

ACR #1542 (poster) - Monday

The efficacy of RTX vs CYC for renal disease in AASV: the RAVE trial

- **197 patients (52% males, age 55 y-o)**
- **Renal disease in 102 (52%) (BVAS/WG renal ≥3)**



	Persistent	New/Worse	None
13. RENAL			( )
a. hematuia (no RBC casts) (>= 1 + or >= 10 RBC/hpf)	☐	○	
b. * RBC casts	☐	○	
c. * rise in creatinine > 30% or fall in creatinine clearance > 25%	☐	○	

Note: *If both hematuria and RBC casts are present, score only the RBC casts (the major item).*

- **eGFR at baseline 53 RTX versus 69 CYC ml/min (p=0.01)**

Geetha D, Fervenza FC for the RAVE-Itn Research Group

ACR #1542 (poster) - Monday

The efficacy of RTX vs CYC for renal disease in AASV: the RAVE trial

- CR at 6 months = 60.8% RTX vs 63% CYC/AZA
- Similar median time to CR
- Parallel increase in eGFR
- Same no. of renal flares at 6, 12 18 mo.
- **CR at 18 months = 74.5% RTX vs 76.5% CYC/AZA**
- **No difference** in remission rate or eGFR according to ANCA, diagnosis or new/relapsing disease

BUT FOR RELAPSES:

4 MPA in RTX suffered 5 renal flares vs 0 CYC/AZA (p = 0.04)

Geetha D, Fervenza FC for the RAVE-Itn Research Group

ACR #1543 (poster) - Monday

Rituximab for ANCA-Associated Vasculitis: A Meta-Analysis of Randomized Trials

3 RCT: RAVE + RITUXVAS + **RATTRAP**

Stone J et al. *N Engl J Med*. 2010;363:221-232
Jones R for the EUVAS, *N Engl J Med* 2010;363(3):211-20
De Menthon et al. *Clin Exp Rheumatol*. 2011;29(1 Suppl 64):S63-71

Mejia C and Lozada CJ – Mount Sinai Medical Center, Miami, FL

RATTRAP / REMICANCA
Closed in June 2006

Relapsing/refractory ANCA+, not responding to CS + immunosuppressants

N = 9

INFLIXIMAB

3 mg/kg d1 and d15

Evaluation d45

- **If CR**: 3 mg/kg/mo × 6 mo
- **If PR**: 5 mg/kg/mo x 12 mo
- **If failure**: 5 mg/kg/mo with new evaluation d73

N = 8

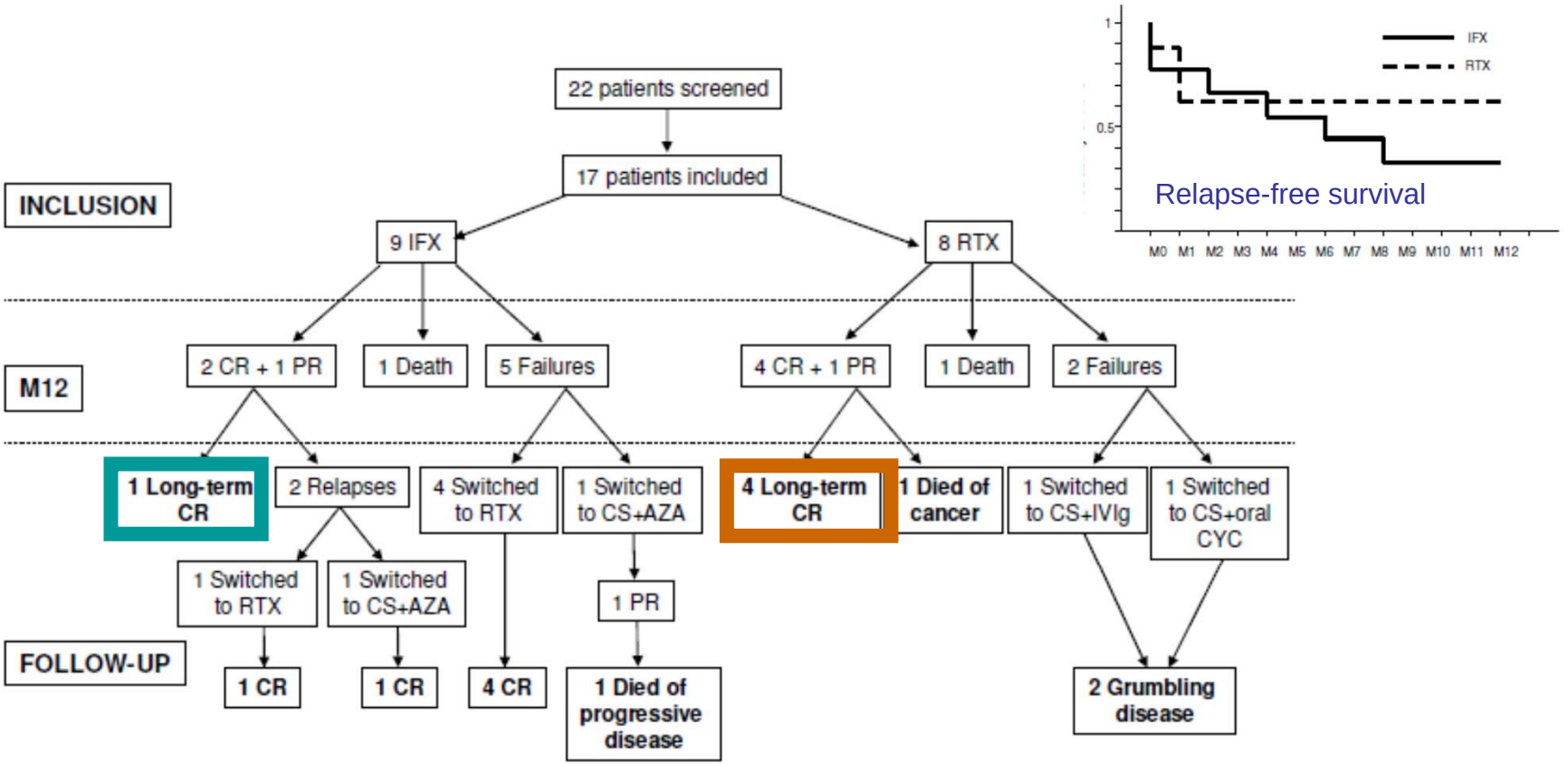
RITUXIMAB

375 mg/m^2/wk × 4

Evaluation d60

- **CR or PR**: new infusion at M4, M8 and M12
- **If failure**: withdrawal

RATTRAP / REMICANCA
Closed in June 2006



de Menthon M et al, Clin Exp Rheumatol 2011;29(1 Suppl 64):S63-71

ACR #1543 (poster) - Monday

Rituximab for ANCA-Associated Vasculitis: A Meta-Analysis of Randomized Trials

3 RCT: RAVE + RITUXVAS + RATTRAP

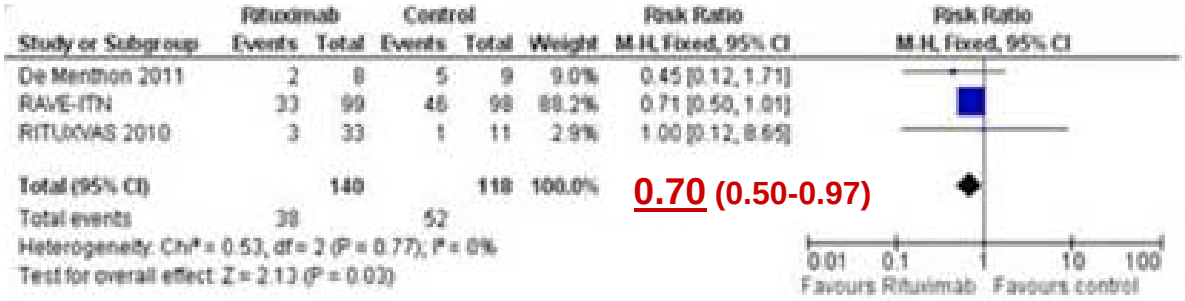


Figure 1A: Clinical remission up to 6 months (Events: patients with flares)

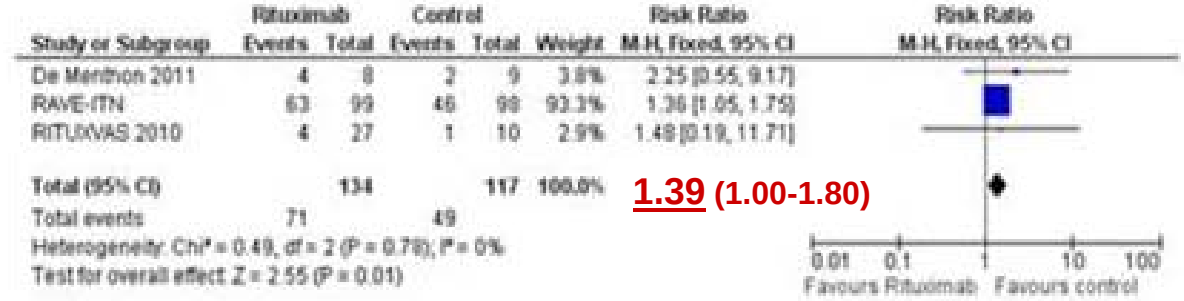


Figure 1B: Clinical relapse up to 6 months (Events: patients who remained free of flares)

Mejia C and Lozada CJ – Mount Sinai Medical Center, Miami, FL

ACR #1543 (poster) - Monday

Rituximab for ANCA-Associated Vasculitis: A Meta-Analysis of Randomized Trials

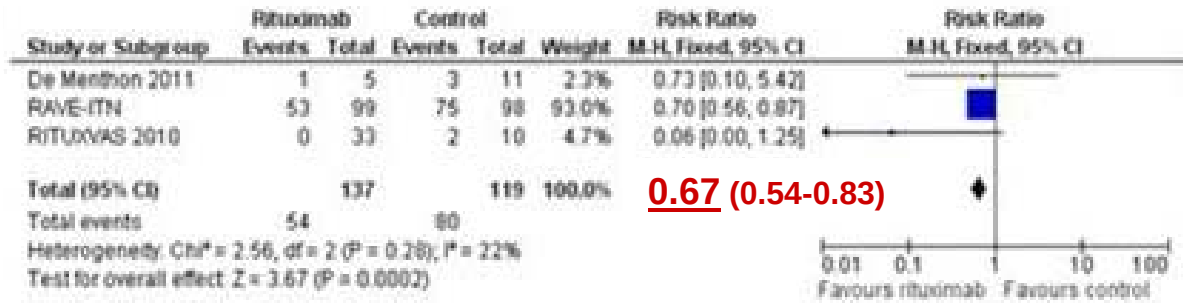


Figure 1C: Decrease in ANCA titers within 6 months. (Events: ANCA levels remained high despite treatment)

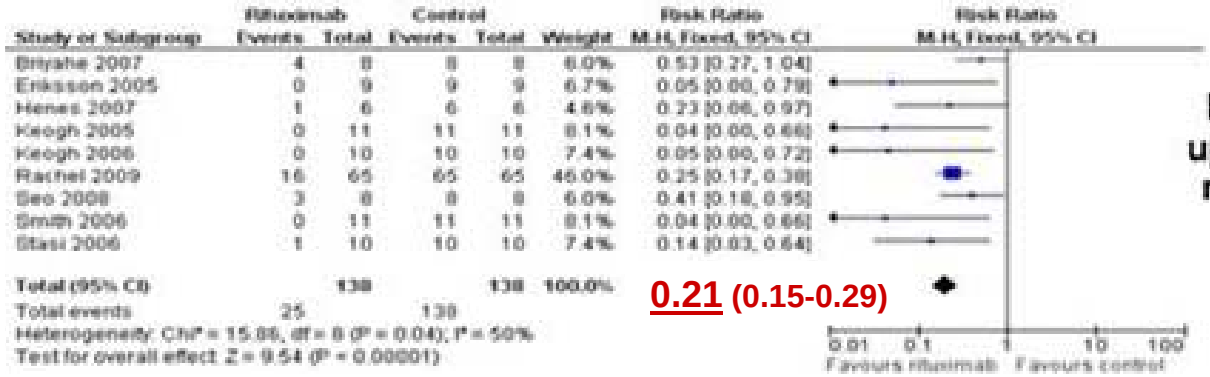


Figure 2A: Clinical remission up to 6 months (Data from non-randomized studies) (Events: patients with flares)

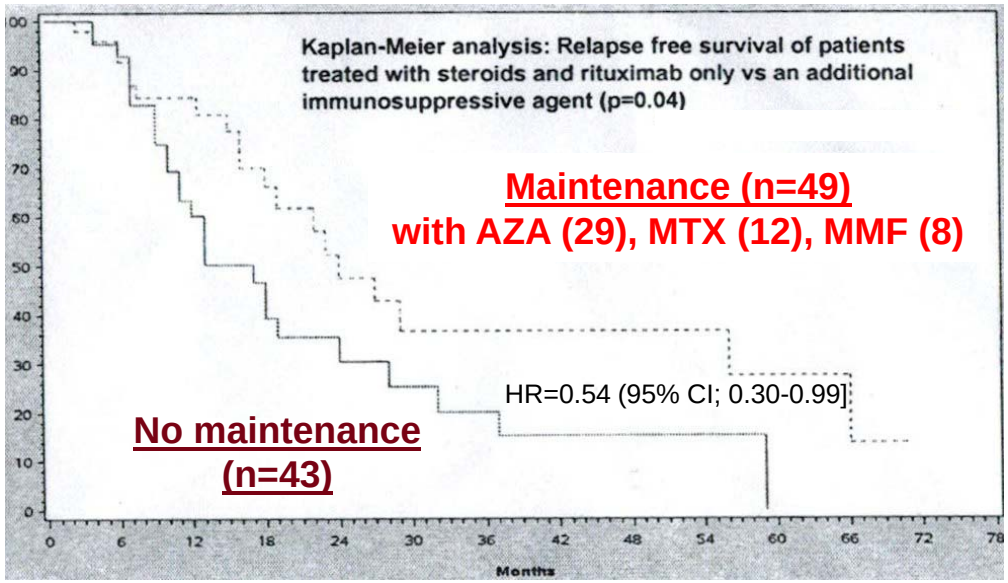
Mejia C and Lozada CJ – Mount Sinai Medical Center, Miami, FL

ACR #1544 (poster) - Monday

Long-Term Outcome of Patients with GPA Treated with Rituximab

Single-center retrospective study:

- **110 GPA patients** (56 F / 54 M; 82% ANCA+) who received ≥1 RTX course (total 211 c)
- mainly for relapses (77%) or persistent disease (14%), few with new diagnosis or for maintenance (5% each)
- 77% received a 1g x 2 scheme
- Iº Efficacy = 97% (few refractory, with lung disease)



Median f/up
23 (1-137) **months**

Relapses
42% with vs. 65% without

Median to 1st relapse
13 (2.5-66) **mo**

With major organ involved
27% with vs. 39% w/o

42.2% were still B cell depleted at relapse!

SAE 7.6% with vs 6.9% w/o; serious infections 4.1% vs 7%

Azar L et al – Cleveland Clinic Foundation, Cleveland, OH

ACR #2383 (poster) - Monday

RTX as Induction and Maintenance Therapies for AASV: A Multicenter Retrospective Study On 80 Patients

Retrospective cohort of AAV patients who received ≥1 RTX between 2002-01/2011, with ≥12 months f/up. :

- 80 patients, most with refractory or relapsing AAV
- 70 (88%) GPA, 9 (11%) MPA, 1 (1%) EGPA
- Started to induce remission in 73, to maintain remission in 7
- 375 mg/m2/week for 4 weeks (55 pts) or 1 g every 2 weeks (17 pts) for induction, or, for maintenance, 500mg / 6months

Relapse-free survival rates after the first RTX

- at 1 year = 80% (95% CI 72–89),
- at 2 years = 63% (95% CI 51–77)
- **at 3 years = 52% (95% CI 39–70)**

Median time to relapse 13 mo (2/16 before mo 6)

A "trend towards RTX superiority" as maintenance (p = 0.13)

9/45 (20%) patients given RTX relapsed vs 7/14 (50%) prescribed various others

SAE: 22 (27.5%) patients, including 12 (15%) with infections leading deaths in 4 (5%)

Only 15 (19%) patients had received anti-pneumococcal vaccine before the first rituximab infusion.

Charles P et al – GFEV Cochin, Paris, France

ACR #1652 (oral) - Monday

Rituximab Versus Azathioprine for Maintenance in ANCA-Associated Vasculitis

MAINtenance of remission using RITuximab in Systemic ANCA-associated vasculitides

Systemic GPA or MPA (with FFS ≥ 1), 18–75 year-old

Newly diagnosed (2/3) or relapsers (1/3)

AFTER achieving remission with CS–CYC

ASSISTANCE PUBLIQUE HÔPITAUX DE PARIS

French Vasculitis Study Group

ACR #1652 (oral) - Monday

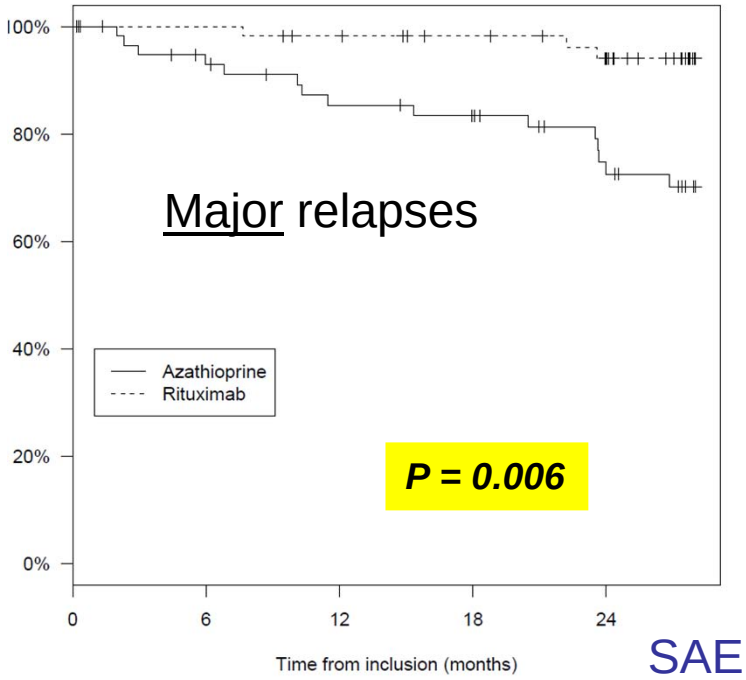
Rituximab Versus Azathioprine for Maintenance in ANCA-Associated Vasculitis

117 patients analyzed

(66 M / 51 F; 55 ± 13 yr; 88 GPA, 24 MPA, 5 KLM; ***93 new / 24 relapsing***)

59 AZA

Relapses
15 (25.4%)



58 RTX

Relapses
3 (5.2%)

SAE 37 AZA vs 32 RTX
Deaths 2+1 AZA vs 0 RTX
Drop outs 21 AZA vs 6 RTX
Infections 12 AZA vs 11 RTX

Guillevin et al – FVSG, France

ACR #1654 (oral) - Monday

Severe adverse events

Infections	Azathioprine	Rituximab	Outcome
Lung infections	**4**	**3**	recovery
GI infections	**1**	**3**	recovery
Herpes zooster	**2**	**1**	recovery
Septicemia	**1**	**0**	death
Tuberculosis, mycobacteria	**1**	**1**	recovery
Endocarditis	**1**	**0**	recovery
Pneumocystis	**0**	**1**	recovery

Guillevin et al – FVSG, France

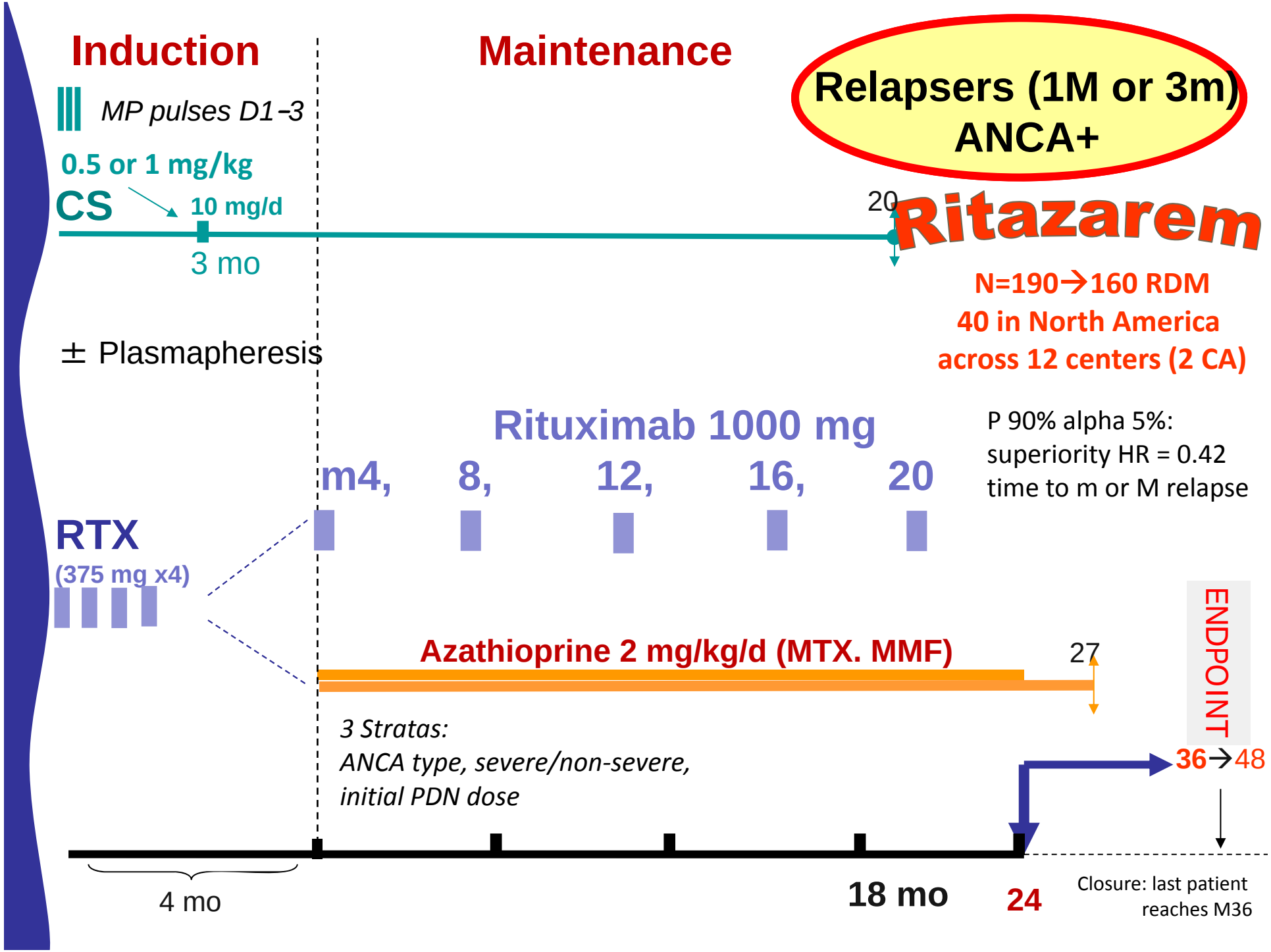
ACR #1654 (oral) - Monday

Severe adverse events

Drug intolerance	Azathioprine	Rituximab	Outcome
Hepatitis	**3**	**0**	recovery
Lymphopenia	**1**	**1**	recovery
Neutropenia	**2**	**0**	recovery
Anemia	**2**	**0**	recovery
GI ischemia	**+1**	**0**	death
Chills, fever	**0**	**3**	recovery

3 AZA deaths: **sepsis** M5, when relapsing; **pancreas cancer**, M24; **bowel ischemia**, M30, when relapsing

Guillevin et al – FVSG, France


Induction
Maintenance
Relapsers (1M or 3m)
ANCA+
MP pulses D1-3
0.5 or 1 mg/kg
CS
10 mg/d
3 mo
20
Ritazarem
N=190→160 RDM
40 in North America
across 12 centers (2 CA)
± Plasmapheresis
Rituximab 1000 mg
m4, 8, 12, 16, 20
P 90% alpha 5%:
superiority HR = 0.42
time to m or M relapse
RTX
(375 mg x4)
Azathioprine 2 mg/kg/d (MTX. MMF)
27
ENDPOINT
3 Stratas:
ANCA type, severe/non-severe,
initial PDN dose
36→48
4 mo
18 mo
24
Closure: last patient
reaches M36

ACR #1654 (oral) - Monday

Primary Endpoint Failure in the RAVE Trial

82/197 (42%) PEF: 36 (36%) in RTX vs. 46 (47%) in CYC/AZA (p=0.09)

	RTX	CYC/AZA	P
Flares	**15** **4 severe, 11 minor**	**23** **9 severe, 14 minor**	**NS** **0.16, 0.53**

B cell reconstitution and ANCA did not predict flares in 1st six mo.

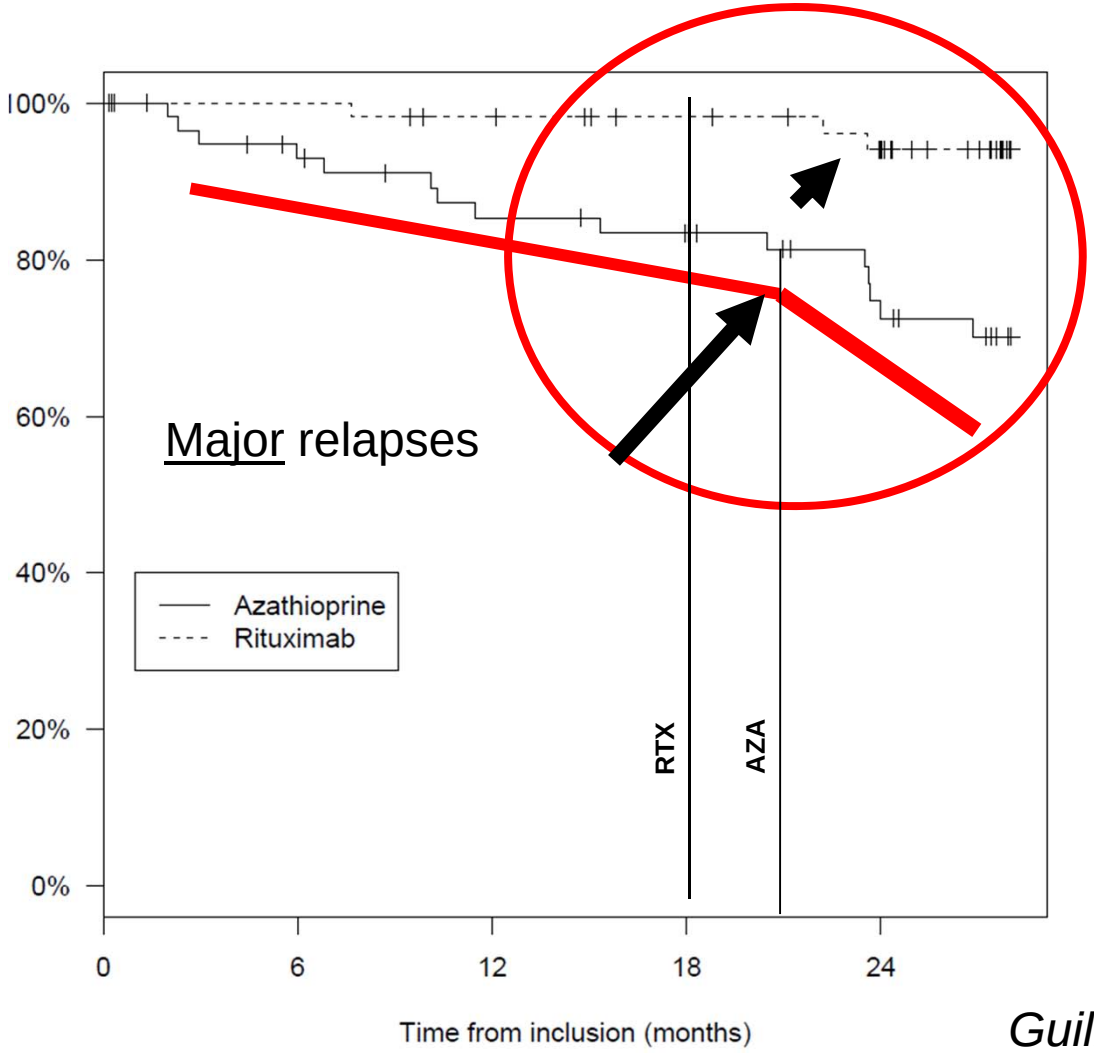
B cell undetectable in 65% of flares (92% RTX, 50% CYC)

Among flares, 24% had ANCA rises (0% RTX, 36% CYC)

Stone JH et al – RAVE/ITN Research Group, Bethesda

ACR #1652 (oral) - Monday

Rituximab Versus Azathioprine for Maintenance in ANCA-Associated Vasculitis



All 3 with GPA
M8, M22 (after 2 minor), M24

Optimal duration?

Guillevin et al – FVSG, France

Other biologics in GPA/MPA/KLD and/or other ANCA-associated diseases (= EGPA)

ACR #2379 (poster) - Tuesday

Successful Treatment of EGPA/CSS with RTX

Retrospective study: 11 EGPA (5 ANCA+) treated with RTX, 06/2007 to 06/2012

- **5 refractory to standard CYC, 3 (relative or real) CI to CYC, 3 relapsers**
- **Sinusitis (7), alveolitis (7), PNS/mononeuritis (4), myositis (2), GN (1), cardiac (1), scleritis (1), GI (1), skin (2), arthritis (2); 8 had ≥1 manifestation**
- **Median BVAS = 7 [1–27]**

→ ANCA and B cells undetectable
→ 8 responders: 1 CR + 7 responses (1 failure, 2 pending f/up)
→ BVAS 3, CS dose, eosinophils, CRP, IgG decreased in all

After achieving CR or a response under RTX, switched to MTX/AZA/LEF

Median f/up of 8 months [1–54]: no relapse

AE: 3 infections (1 pneumonia, 2 URTI)

	Before RTX	After RTX
BVAS 3	7 (1–27)	4 (1–8)
CS mg OD	30 (5–80)	9 (4–12)
CRP (mg/dl)	0,6 (0,1–5,5)	0,2 (0–8)
Eosinophils/l	300 (0–3300)	200 (0–1600)
Ig G (g/l)	7,4 (0,3–11)	5,3 (5–7,7)

Dubrau C et al – Bad Bramstedt, Germany

ACR #1655 (oral) - Monday

An Open-Label Trial of Abatacept in Mild Relapsing GPA

Mild relapsing: confined to ≥1 sites, with Rx being the reinstitution or increase in CS to ≤30mg OD and/or an increase or addition of a 2nd immunosuppressant but not CYC (no AH, no renal)

CTLA4-Ig, abatacept 10 mg/kg IV D1, 14, 28 then monthly

On top of ongoing Rx with CS (15), AZA (3), MTX (7), MMF (4)

→ 20 patients

Variable	Value at Study Entry	
Age (range)	45 years (17-73)	
Female/Male	9/11	
PR3-cANCA	80%	
MPO-pANCA	10%	
GPA duration mean (range)	100 months (5-326)	
BVAS/WG mean (range)	3.1 (1-6)	
VDI mean (range)	2.5 (0-7)	
Organ Involvement	**Before Study Entry (Ever)**	**Active Disease at Study Entry**
Constitutional	85%	30%
ENT	100%	90%
Musculoskeletal	75%	50%
Cutaneous	60%	40%
Mucous membranes	25%	5%
Lung	70%	30%
Kidney	40%	-
Eye	30%	-
Nerve	20%	-

Langford C et al – Cleveland Clinic Foundation / VCRC

ACR #1655 (oral) - Monday

An Open-Label Trial of Abatacept in Mild Relapsing GPA

- **18 (90%) had disease improvement**
- **16 (80%) achieved remission with BVAS/WG=0 (median duration of remission before study closure was 12 months [4-21])**
- **11/15 on PDN were able to stop PDN**

- **3 relapses (19% of those who achieved remission), at a median of 8.3 months**
- **6 (30%) dropped out because active disease, not severe (3 relapsers + 3 failures)**

- **9 SAEs in 7 patients, including 7 infections, none severe**

Langford C et al – Cleveland Clinic Foundation / VCRC

Does it warrant further study for limited and mild relapsing GPA?

Back to basics…

ACR #1653 (oral) - Monday

Outcomes in Patients with GPA Treated with Short- vs. Long-Term Maintenance Therapy

Cleveland: retrospective study on GPA patients receiving CYC/MTX induction then MTX/AZA maintenance
< or ≥18 months maintenance?

157 patients (cohort, 797), median 46 yrs, mean f/up 3.1 yrs [1.5-16.8]

- **CYC (78%)/MTX (22%) then MTX/AZA (+CS 19mg OD at Rem.)**
- **Univariable: > or <18mo, HR=0.71 [95% CI, 0.43-1.18; p=0.18]**
  but Rx >36 mo.: HR=0.34 [95% CI, 0.15-0.76; p=0.008]
- **Duration of Rx: HR=0.77 [95% CI, 0.65-0.92; p=0.003]**
- **Even after adjustment for PDN: HR=0.58 [0.4-0.83]**
- **No association with ANCA status, BVAS at Dx, pulse MP**
- **In the short-term Rx, when relapse, PNS more frequent (15% vs. 1.4%, p=0.033)**
- **88% of long-term group relapses occurred AFTER stopping Rx**
- **For relapsers under Rx: 52% were <15mg/wk MTX**
  75% were ≤50mg OD AZA
- **No diff. in SAE**

Springer J et al – Cleveland Clinic Foundation

ACR #1541 (poster) - Monday

Does leflunomide have a place as remission maintenance therapy in AASV?

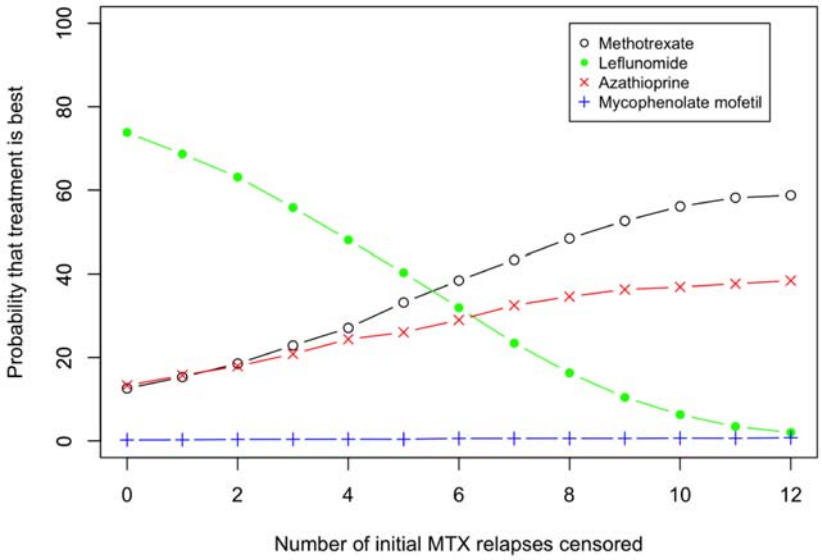
A Bayesian Network Meta-Analysis with Hypothesis Driven Sensitivity Analyses to Adjust for Potential Biases

3 RCTs comparing at least 2 of the following: MTX, LEF, AZA, MMF in adult AASV
→ **Bayesian** arms-based fixed-effects **network meta-analysis** using HR data
+ Sensitivity analyses by down-weighting the effect of LEF in the LEF-MTX RCT because of the early trial termination + by modeling the removal of early MTX relapses as the initial dose titration of MTX in this trial was slow

→ **Probability to be best: LEF 90%, AZA 6%, MTX 4% and MMF 1%**

→ LEF: at best decreased to 74% after treatment effect down-weighted for early trial termination in the LEF-MTX RCT

→ **LEF remained best ranked unless 6/13 of the initial MTX relapses were censored**



Hazlewood G et al – Toronto, Calgary

ACR #1656 (oral) - Monday

Treatment of SNV in patients >65 years-old: Results of the Multicenter Randomized Cortage Trial

Objective: to reduce treatment-related morbidity & mortality

Pagnoux et al – FVSG, France

ARM A

Conventional treatment

According to { **diagnosis**

FFS

PAN/EGPA:

FFS = 0: CS alone

FFS ≥ 1: CS + IV CYC 500 mg/m^2/2–4 wk + 3 pulses then AZA/MTX 18 mo

GPA/MPA:

CS + IV CYC 500 mg/m^2/2–3 wk + 3 pulses then AZA/MTX/MMF 18 mo

“Lighter” ARM B

CS: shorter duration

& lower cumulative dose

+

IV CYC for all

500 mg fixed dose d1, d15, d29,
then every 3 wk
→ remission, maximum of 6 pulses

then AZA/MTX for 18 mo

Statistical hypothesis

- **Reduction of treatment-related morbidity by 30% at 3 years**

(70% → 40%)

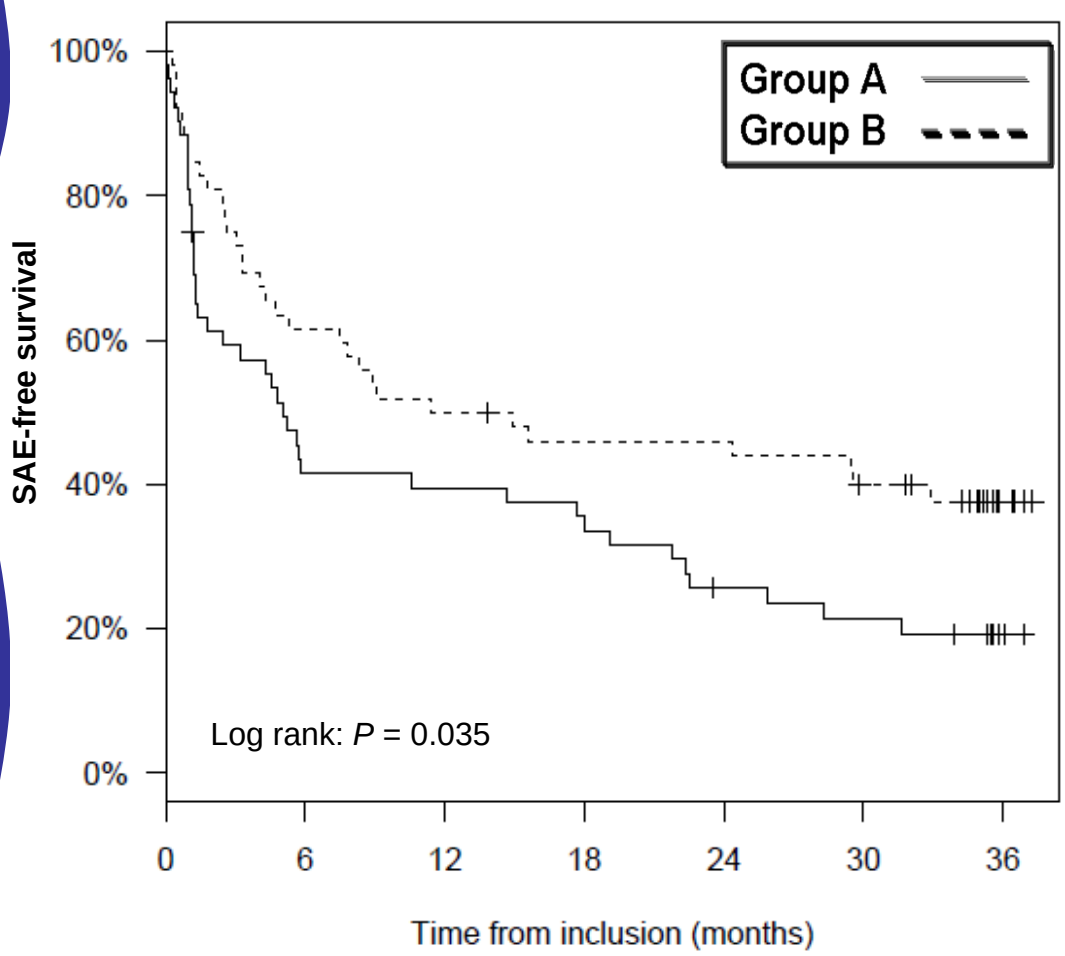
Mouthon et al. Medicine 2002;81:27–40

- **1º criterion = time to 1st Severe Adverse Event**

Results

Characteristic at diagnosis	Arm A Conventional N = 52	Arm B Lighter N = 52
Age, mean ± SD, yr	**75.8 ± 6.7**	**74.5 ± 5.8**
maximum	*91.8*	*90.5*
Male, n (%)	31 (60)	24 (46)
Diagnosis (n)		
MPA	**25**	**21**
GPA	**16**	**21**
EGPA	**6**	**7**
PAN	**5**	**3**
ANCA positivity, n (%)	43 (83)	48 (92)

Results: primary endpoint



≥ 1 SAE at 3 years

Arm A = 80.8% vs

Arm B = 62.4%

(*P* = 0.035)

Average SAE/patient =
2.12 ± 2.07 Arm A vs
1.33 ± 1.49 Arm B

SAE-free survival

HR arm B/A = 0.61 [0.38−0.97]

	No. of events	Median survival time	Median follow-up	3-yr survival [95% CI]
Group A, n = 52	41	5.05	35.34	19.2% [10.9−34.1]
Group B, n = 52	32	13.16	35.11	37.6% [26.4−53.7]

They don't care about us ?!!

Here was a picture from Jill Greenberg, photograph
As we did not get the copyright, we removed it
AND Jill Greenberg sued CanVasc
AND asked for 1600 CAD!! that is the cash price of 250mg of rituximab!

We hope that other artists are more philanthropists.. and do not charge researchers for such a thing... what a world!! what really matters?!
Let's hope she, as a human person and artist, may consider reimbursing us!

Until then, feel free to visit Jill Greenberg website and visit her contact page,..
https://www.jillgreenberg.com/contact

ACR #284 (poster) - Sunday

Treatment and Outcome of ANCA-Associated Vasculitis in Children: A Pilot Study

Single-center study, on the 4 girls + 4 boys diagnosed since 07/2010

- **13.8 y.o. [10.9-17.4]; 6 PR3+, 1 MPO+, 1 ANCA-negative**
- **7 renal (AKI 2), 4 lung (AH 3), ENT 3 (2 SGS), eye 3 (1 episcleritis)**
- **mean PVAS at diagnosis = 19 [14-29]**
- **all 8 received CS-IV CYC (+ 4 also with PLEX) according to the 2009 EULAR recommendations**

→ 7 achieved remission and were switched to AZA (1 developed ESRD)

→ At month 6, PVAS = 3 [1-3]

→ No relapse during f/up (last assessment 05/2012)

SAEs: 2/4 PLEX developed line clots with PE (vs no VTE in any others)
1 lung blastomycosis in 1 CYC-CS-PLEX, cured with antifungal

Twilt M et al – TSH, Toronto

ACR #285 (poster) - Sunday

Rituximab for Severe Disease Flares in Childhood ANCA Vasculitides

TSH 01/2009-07/2011: 5 girls + 1 boy (median age, 7.8 yrs)

- **4 PR3+, 2 MPO+ (at Dx: all with lung, 3 renal, 3 ENT, 2 SGS)**
- **all relapsing (2 still on MTX maintenance)**
- **all previously treated with CYC CS + maintenance**
- **PVAS = 6 at relapse**
- **5 with lung involvement at relapse (AH ± nodules)**
- **1 with renal involvement**

RTX 500mg/m2 at D1 + D14 with prednisone (2mg/kg/d initially)
(+ PLEX for 2 of them)

→ PVAS=0 in 4 at M3 and 5 at M12
→ ANCA became negative in 4 patients (at M12), all B depleted
→ 1 PjP + 1 with moderate reaction to infusion (fever, myalgias)
→ 5 received a 2nd course between M6 and M13 for B cell reconstitutº

Twilt M et al – TSH, Toronto

ACR #2596 (oral) - Wednesday

Rituximab Treatment for ANCA-Associated Vasculitis in Children

Seattle 03/2001-03/2011: 7 girls + 8 boy (median age, 13 yrs [8-15])

- **mean BVAS/WG=7.8 [1-12] with 11 with severe disease**
- **new and relapsing patients (prior CYC exposure, 44g)**
- **11 RTX+ CS+CYC (+6 PLEX), 1 +CYC, 1 +MTX, 2 +MTX+CS,**

→ BVAS/WG=0.4 at M3 [0-2], all achieved BVAS/WG=0
→ + 8.6g of CYC when given for initial induction, +11g for CYC combos
→ Average f/up 2.5 yrs [0.25-5.1]
→ 9 received only 1 course and did not relapse over a mean of 2.3yrs
→ 5 relapsed after a mean of 21.8 mo. and were retreated with RTX
→ 6 mild reactions to infusion (fever, myalgias)

Moore KF et al – Seattle Children's Hospital / University of Washington

Largest pediatric series but difficult to interpret because of CYC/MTX combos

Other (non-ANCA) vasculitides and miscellaneous

ACR #1657 (oral) - Monday

Peg-IFNa/Ribavirin/Protease Inhibitor Combination Is Highly Effective in HCV-Mixed Cryoglobulinemia Vasculitis

30-40% of patients are non-responders or relapsers to Peg-IFNa plus Ribavirin, w/wo Rituximab

- Open single-center cohort study on 13/27 HCV-MCV (mean 61 yrs, 7F/6M, all genotype I)

- **5 (38%) relapsers, 8 (62%) non-responders, 10 (77%) had received RTX**
- **HCV RNA 5.85Log copies/mL; Metavir at 4 in 6; 3 in 4; 2 in 3**
- **12 (92%) type II IgMk MC, 1 type III MC**
- **Purpura (10), polyneuropathy (10), arthralgia (6), kidney (3)**
- **Treated with Peg-IFNa/Ribavirin**
  + Telaprevir (375 mg TID, n=8)
  or + Boceprevir (800 mg TID, n=5)
- **with sufficient f/up (14/27 not sufficient)**

- **At 1 month:** **11 (85%) early virological responses (HCV RNA <1.1)**
  9 (69%) complete + 4 (31%) partial clinical responses
- **At 3 months:** **MC serum level 1.3 → 0,3g/l**
  C4 level 0.09 → 0.13g/l

- **All 13 patients ≥1 AE: fatigue 92%, anemia 84%, neutropenia or bacterial infection 53%, nausea or mild rash under Telaprevir 30%, thrombocytopenia 15%**

Saadoun D et al – Paris, France

ACR #1547 (poster) - Monday

A 4 + 2 infusion protocol of Rituximab provides long-term beneficial effects in patients with HCV-associated MC with membranoproliferative nephritis and severe polyneuropathy

27 patients (mean age 60.2 [35–78] years, HCV infected 96%) with symptomatic type II MC: kidney (diffuse mbprolif GN 15), PNS (26, mainly sensory), skin ulcers (9)

RTX 375 mg/m2 x 4 then 1 dose 375mg/m2 1 and 2 months later
No other treatment
Follow-up = mean 54.3 [12–96] months

CR for all skin lesions
CR in 80% of the PNS (improvement in the disability score)
Nephropathy improved: creat. 2.2→1.6 mg/dl at M2; proteinuria 2.3→0.9g/24h
Decrease of cryocrit, and increase of complement C4\
Safety: **no severe side effect**

BUT 9 relapses, after a mean of 31.1 [12–54] months: new RTX courses effective

Roccatello D et al – Torino, Italy

ACR #1622 (oral) - Monday

Characteristics of Infectious Cryoglobulinemia Vasculitis in the Absence of HCV Infection: Results From the French Nationwide Cryovas Survey

81 French centers included 18 infectious but non-HCV mixed CryoVas diagnosed between 1995 and 2010.

11 women, 7 men; mean age 57.9 ± 13.5 yr
Cryoglobulinemia type II in 12 (67%) and III in 6 (33%)
Histological confirmation of vasculitis was available in 72%

Baseline manifestations: purpura (78%), GN (28%), arthralgia/arthritis (28%), peripheral neuropathy (22%), skin necrosis (22%), cutaneous ulcers (17%), myalgias (11%). No GI, CNS or lung involvement

Infectious causes: virus [HBV in 4, CMV, EBV, parvovirus B19 and HIV in 1 each], pyogenic bacterial infection in 6, parasitic infection in 2 (ascaridiasis and leishmaniosis), leprosy (1) and
Candidiasis (1)

6 received CS, 1 CYC initially
14 received specific anti-infectious therapy → 10 achieved sustained remission, 2 died of the underlying infection (bacterial septicemia and Candida pneumonia), 2 had refractory or relapsing disease related to HBV infection (achieved remission with rituximab in addition to antiviral drugs)
4 did not receive specific therapy (CMV, EBV, parvovirus and HBV) but achieved remission

Terrier et al – Paris, France

ACR #2388 (poster) - Monday

Urticarial Vasculitis: Clinical Study

Retrospective analysis of 19 UV patients / 877 patients with cutaneous vasculitis in 1 center

Urticarial vasculitis = urticarial skin lesions of >24 hr duration + histological small vessel vasculitis

8 men, 11 women, with a mean age of 33.2 ± 26.1 years

Also with purpura (7), arthralgias (5), arthritis (7), abdominal pain (2), nephropathy (2)

Hypocomplementemia (low C4) in 2 (also had low C1q), increased ESR (6), leukocytosis (7), anemia (4), positive ANA (2), positive RF (1) - none developed SLE or RA

Main histological findings: vascular and perivascular infiltration, mainly of neutrophils, lymphocytes and eosinophils, endothelial swelling and fibrinoid necrosis

Precipitating factors and/or possible causes = upper respiratory tract infections (4), drugs (4), malignancy (megakaryocytic leukemia, 1), Schnitzler syndrome (1)

Most common treatments: corticosteroids (10), antihistaminics (6), chloroquine (4), colchicine (2), NSAIDs (1), cytotoxic agents (1 with Schnitzler)

→ After a mean follow-up of 16.7 ± 27.8 mo (median 4 months), recurrences in 4, death in 1 because of underlying malignancy

Loricera et al – Santander, Spain

PACNS

ACR #295 (poster) - Monday

Brain Biopsy Diagnosis in Magnetic Resonance Imaging Negative Childhood PACNS

Single centre cohort study of children diagnosed with cPACNS satisfying modified Calabrese criteria, between 1990 and 2010, with normal MRI studies but subsequent confirmatory brain biopsy

Total of 107 cPACNS: 80 angiography-positive, all with abnormal MRI
27 angiography-negative, including 2 with normal MRI

2 boys, 11 and 13 y.o., both with acute onset seizures → status epilepticus
Both patients had elevated ESR/CRP
1 with normal CSF, 1 with slightly raised WBC in CSF

Rx = CS + IV CYC for 6 months, then MMF for 18 months

On f/up: 1 with mild residual neurologic deficits and intermittent seizures
1 with excellent outcome, no deficit and seizure-free on Topiramate

→ A negative MRI does not rule out cPACNS in children with refractory seizures,

Lee SJ et al – TSH, Toronto

ACR #304 (poster) - Monday

Burden of Childhood CNS Vasculitis: Identifying High Risk Factors for Poor Cognitive Outcome

Single centre cohort study of PACNS children (Calabrese criteria) between 1990 and 2010 and who had completed a standard neurocognitive evaluation

Primary study outcome = Full Scale IQ (FSIQ)

Secondary outcomes = PSOM, PedsQL, disease activity and disease damage (VAS)

104 cPACNS in the cohort: **63 (61%) had a complete neuropsychological** assessment

- **19 small vessel PACNS (SVc); 44 angiography-positive (APc)**
- 28 girls (16 SVc, 12 APc); 35 boys (3 SVc, 32 APc)
- Median age at Dx 8.1 yrs; (SVc 9.8 vs. APc 7.5 yrs)

At diagnosis

- **SVc had more seizures (79%), acute behaviour change (47%; p<.05)**
- APc had more hemiparesis (91%, p<.05).

Outcomes

- mean FSIQ = 93 (52-132), SVc 82 (54-119) vs APc 97 (52-132) - p<.05
- Abnormal FSIQ (<85) in 53% of SVc vs 27% of APc
- **SVc lower scores in verbal comprehension, working memory, processing speed**

Prediction model: **SVc and seizures associated with more residual cognitive deficits**

Gowdie PJ et al – TSH, Toronto

ACR #1551 (poster) - Monday

Primary Angiitis of the Central Nervous System: Description of the First 52 Adult Patients Enrolled in the French COVAC' Cohort

Multicenter retro-prospective cohort study of PACNS initiated 2 years ago

52 patients (30 M/22 F; median age at Dx 43.5 [18–79] yr) from 21 French hospitals

- 31 (60%) underwent brain biopsy → vasculitis in 19 (37% biopsy-proven PACNS)
- 33 had persistent (>6 mo) conventional cerebral angiography suggestive (33 [63%])

Most frequent initial manifestations: focal neurological deficits (83%), headaches (54%), cognitive impairment (35%), aphasia (35%) and/or seizures (33%)

Compared to biopsy-proven, angiography-diagnosed PACNS patients had more frequent focal neurological deficits and bilateral infarctions on MRI (p0.04) but less frequently seizures or cognitive disorders.

Lymphocytic infiltrates were observed in 15/19 positive biopsies, necrotizing vasculitis in 8, and granulomatous infiltrates in 6.

De Boysson H et al – FVSG, France

ACR #1551 (poster) - Monday

Primary Angiitis of the Central Nervous System: Description of the First 52 Adult Patients Enrolled in the French COVAC' Cohort

Multicenter retro-prospective cohort study of PACNS initiated 2 years ago
52 patients from 21 French hospitals

- **All but 1 (98%) received CS, as monotherapy for 7 (14%)**
- **43 (83%) also received first-line IV CYC (1 received RTX)**
- Maintenance consisted of AZA for 24/44 (55%) given CYC and the one RTX-treated, and MTX or MMF for 2 others

Median f-up = 35 (6-148) mo post-dx
→ **3 patients died (all with new cerebral infarctions)**
→ **14 (27%) relapsed at least once**
→ **Neurological damage in 40 (77%)**

→ Multivariable analysis retained **intraparenchymatous and meningeal gadolinium uptakes at diagnosis as independent predictors of poor prognosis or relapse** (HR2.45 [95% CI, 0.99–6.08] and 1.88 [95% CI, 0.80–4.46], respectively)

De Boysson H et al – FVSG, France

ACR #1550 (poster) - Monday

Long-Term Outcomes of Patients with Reversible Cerebral Vasoconstriction Syndromes

57 patients in **local RCVS registry**
Questionnaires mailed once with Headache screening questionnaire, Headache Impact Test-6 (HIT-6), Barthel index (BI), Patient Health Questionnaire (PHQ-9) and European QoL Questionnaire (EQ-5D-5L).

3 refused to participate, 26 inaccessible or LOF, 11 did not returned forms
→ **17 returned the forms** (5 incomplete)

Mean f-up from Dx = 112 months [10–254]

- 88% reported improvement in headaches with 8 **(47%) still having some headaches** but 1 worsening and 2 (17%) with severe impact (HIT 60)
- Mean MIDAS 11.83 with only 2 (17%) with severe disabling headaches
- **93% were independent** per BI scores 85 (8 patients scored 100)
- 77% and 54% had slight to severe problems with pain and anxiety respectively
- PHQ-9: 28% with moderate (3) or severe (1) depression

→ **Favorable outcomes in terms of headaches and stroke**, but some other possible damage

John S et al – Cleveland, USA

Other

ACR #1523 (poster) - Monday

Systemic Vasculitis and Pregnancy: a Multicenter Study On Maternal and Neonatal Outcome of 44 Prospectively Followed Pregnancies

Retrospective analysis of 44 pregnancies in 34 patients with SV:

- **Behcet's (19 pregnancies in 15 patients), EGPA (7 in 7), Takayasu (6 in 4), GPA (3 in 3), PAN (3 in 2), Henoch-Schönlein (2 in 1), ANCA- associated neuropathy (3 in 1), Cogan (1 in 1)**
- **Caucasians (28), Afro-americans (2), Asians (2) or African (1)**
- **Mean age at disease onset 24.7 ± 6.9yrs, at diagnosis 26 ± 6.1yrs**
- **Mean duration of SV before pregnancy 6.5 ± 5yrs**
- **11 previously treated with cytotoxic or embriotoxic drugs but not during pregnancy**
- **5 by *in vitro* fertilization (female infertility), 1 by oocyte donation in 1 post-CYC-primary ovarian failure**

During pregnancies

→ **6 flares of SV occurred during T1 (13.9%), 7 (20%) during T2, and 3 (9%) during T3 (onset of BD at 10° week in 1 pt)**

→ **Pregnancy-related complications in 14 pregnancies, including 4 gestational diabetes**

Delivery

→ **At a mean of 37.7 ± 3 weeks of gestation**

→ **5 preterm deliveries (< 34° week)**

Newborn

→ **33 live births (2 twins pregnancy), 8 miscarriages (1 in a twin pregnancy), 1 fetal death (2 pregnancies still ongoing)**

→ **6 newborns had neonatal complications**

Postpartum

→ **11 flares (32.3%) for 34 pregnancies with available data and f/up**

Fredi M et al – University of Brescia, Italy

ACR #1523 (poster) - Monday

Systemic Vasculitis and Pregnancy: a Multicenter Study On Maternal and Neonatal Outcome of 44 Prospectively Followed Pregnancies

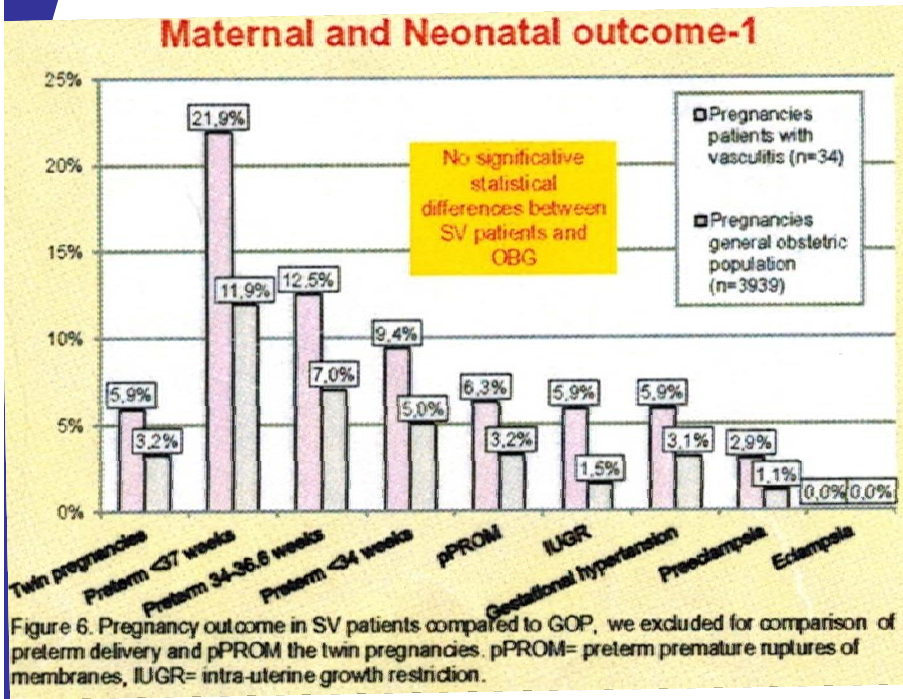


Figure 6. Pregnancy outcome in SV patients compared to GOP, we excluded for comparison of preterm delivery and pPROM the twin pregnancies. pPROM= preterm premature ruptures of membranes, IUGR= intra-uterine growth restriction.

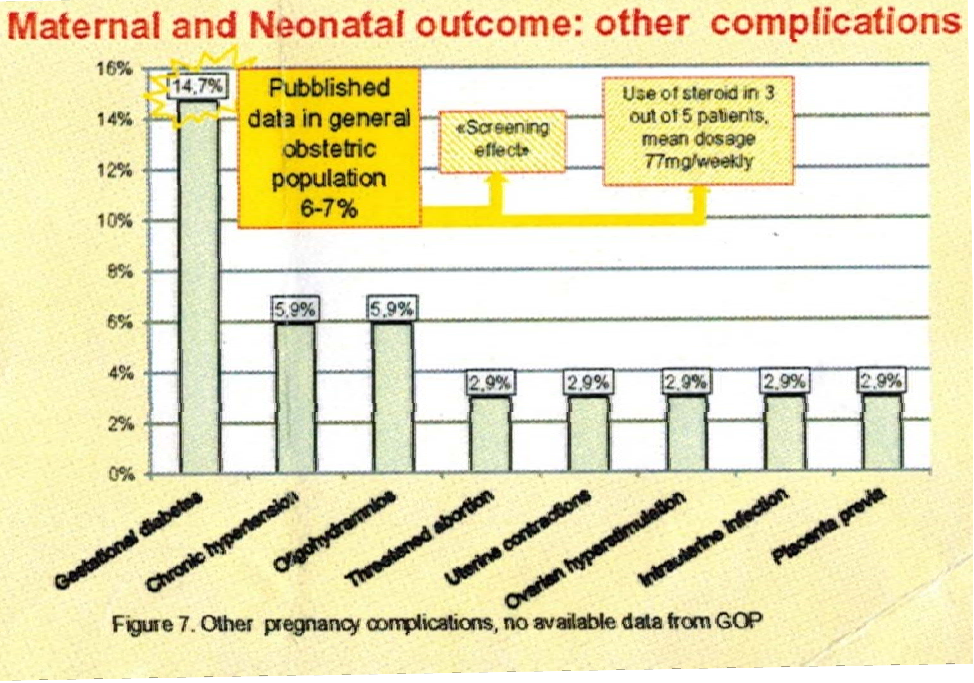


Figure 7. Other pregnancy complications, no available data from GOP

Fredi M et al – University of Brescia, Italy

ACR #1525 (poster) - Monday

Determinants of Poor Quality of Life in ANCA Associated Vasculitis

Basu N et al – University of Aberdeen, UK

ACR #868 (oral) - Sunday

Illness Perceptions Among Patients with Different Forms of Vasculitis

Grayson P et al – Boston University Medical Center

ACR #1527 (poster) - Sunday

Patient Global Assessments for disease activity are predictive of future flare in GPA

Tomasson G et al – Reykjavik, Iceland

#1 sign

ACR #1528 (poster) - Sunday

Assessing Fatigue in SV From the Patient's Perspective

Grayson P et al – Boston University Medical Center

ACR #1526 (poster) - Sunday

Patient Reported Outcomes in AASV. A Prospective Comparison Between BVAS and Routine Assessment of Patient Index Data 3

Sreih A et al – Rush University Medical Center, Chicago, IL

Not enough? These ones were also of great interest…

- **Prevalence of Anti-Neutrophil Cytoplasmic Antibodies in Infective Endocarditis: An Analysis of 109 Cases #2565**

  → C-ANCAs 12%, P-ANCAs 10%, both 1%. anti-PR3 (3%), anti-MPO (3%), various pathogens and both native and prosthetic valves

  Mahr et al

- **Factors Associated with Major Cardiovascular Events in Patients with Primary Systemic Necrotizing Vasculitides: Results of a Longitudinal Long-Term Follow-up Study #2563**

  → BMI >30 kg/m2 and/or a high-risk status are strongly associated with MCVE; although IMT is not associated with MCVE, it distinguished between patients with early or late MCVE

  Terrier et al

- **Urinary Biomarkers in Vasculitis Associated with Anti-Neutrophil Cytoplasmic Antibodies #2397**

  → MCP-1 discriminates best but remains imperfect in distinguishing between active renal disease from remission and can also be elevated in the absence of renal involvement; change in AGP, KIM-1, or NGAL show even more modest ability to distinguish active renal disease from remission

  Monach et al

… as well as these last ones!

- **Pauci-Immune Glomerulonephritis in the Elderly: Disease Severity and Outcomes #2398**

  → patients >70 yr have worse renal outcomes associated with a higher serum creatinine and lower GFR at time of diagnosis, and an increased risk of progression to hemodialysis despite similar BVAS/WG scores

  Manno et al

- **Pathogenesis of Atherosclerosis in Granulomatosis Polyangiitis #1537**

  → GPA patient-derived MPs, induce in vitro expression of ICAM-1 on HUVECs and enhanced surface expression of activated α2bβ3 integrin on platelets

  Hajj-Ali et al

- **IgG4 Plasma Cell Infiltration in Granulomatosis with Polyangiitis (formerly Wegener's) Lung Biopsies #1534**

  → Lung biopsies from both IgG4-RD and GPA patients are characterized by lymphoplasmacytic infiltrates and IgG4+ plasma cells. Histopathological features, particularly the finding of obliterative phlebitis in IgG4-RD and the absence of granulomatous inflammation, are essential in distinguishing between the 2 conditions

  Carruthers et al

Happy New Year and don't forget to register for this meeting!!

April 14 - 17 2013

16th International Vasculitis & ANCA Workshop

"Institut des Cordeliers"
Paris - France

Scientific committee :

Pr. Loïc Guillevin
(president)

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