The prognosis of heart failure in patients with rheumatoid arthritis

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Conclusions

Patients with rheumatoid arthritis and heart failure have an unfavourable prognosis. One third of them were hospitalized for HF or died during follow-up. In addition to patient characteristics, smoking, insufficiently controlled inflammation and treatment with glucocorticoids significantly increased the risk of hospitalization or death.

Background & Objectives

Heart failure (HF) is a condition with high rates of hospital admission and mortality. The impact of rheumatoid arthritis (RA) and its treatment on the prognosis of prevalent HF has been insufficiently studied.

The objective was to evaluate deterioration of HF and mortality in patients with RA and concomitant HF.

Patients & Methods

The prospectively followed cohort of the German register RABBIT continuously includes RA patients with a new start of a DMARD after at least one csDMARD failure. Among all patients enrolled between 05/2001 and 10/2017 (n=15,037), patients with prevalent HF were selected (n=393) and followed until their end of observation or death. As composite outcome, deterioration of HF requiring hospital admission and death were analysed by:

(I) Calculation of incidence rates (IR) for current treatment at time of event (9-months risk window after last infusion of rituximab).

(II) Investigation of risk factors using generalized estimation equations (GEE). To avoid uncertainties when allocating therapies, only treatment episodes >6 months were included. Missing values of DAS28, CRP and physical function were addressed by multiple imputations.

Results

Of 393 patients with prevalent HF and 1,490 patient years of follow-up, a total of 131 patients had at least one outcome of interest:

- 19 deteriorations of heart failure
- 123 deaths (main causes: infections (34%) and cardiovascular events (31%, thereof 58% heart failure))

The mean time until deterioration/death was 30/37 months.

Table 1: Baseline characteristics of patients with prevalent heart failure.

	Patients without outcome n=262	Patients with outcome n=131
Age in years	66.8 ± 9.1	69.4 ± 7.9
Female patients	178 (67.9%)	75 (57.3%)
Rheumatoid factor positive	190 (73.6%)	105 (80.2%)
Disease duration in years	12.7 ± 10.1	14.1 ± 11.4
C-reactive protein in mg/l	22.9 ± 32.5	38.6 ± 57.2
DAS28-ESR	5.4 ± 1.3	5.6 ± 1.5
% of full physical function	50.2 ± 24.2	43.1 ± 24.0
Comorbidities		
Sum of comorbidities	5.6 ± 2.6	6.5 ± 3.1
Hypertension	206 (78.6%)	105 (80.2%)
Coronaray artery disease	109 (41.6%)	62 (47.3%)
Diabetes mellitus	73 (27.9%)	45 (34.4%)
Chronic renal disease	62 (23.7%)	44 (33.6%)
Osteoporosis	103 (39.3%)	69 (52.7%)
Smoking		
Never	118 (45.0%)	45 (34.4%)
Ever	117 (44.7%)	52 (39.7%)
Unknown	27 (10.3%)	34 (26.0%)
Therapy with glucocorticoids	229 (87.7%)	116 (88.5%)
Daily dosage in mg/d	5.5 ± 5.5	6.8 ± 6.1
Actual therapy with DMARDs		
csDMARD	36 (13.8%)	28 (22.0%)
TNF inhibitor	142 (54.6%)	63 (49.6%)
Other bDMARD	82 (31.5%)	36 (28.3%)

Incidence rates for deterioration/death

Crude IR were highest in patients under csDMARD only exposure (figure). IR were similar during the first 3 or 6 months after start of treatment and thereafter (data not shown).

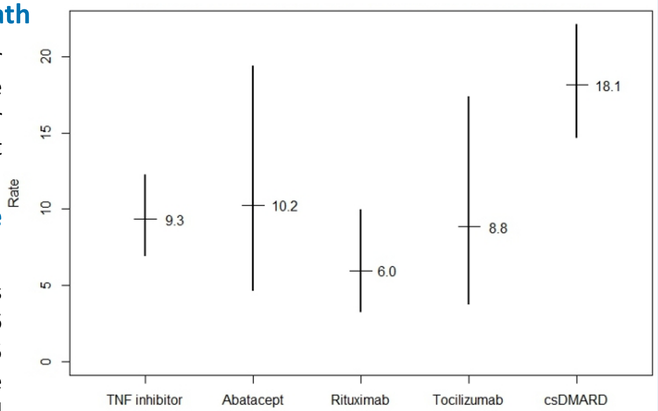

Figure: Crude incidence rates of composite outcome per 100 patient years.

Risk factors for hospitalization due to heart failure or death

This analysis was restricted to 335 patients who had at least one treatment episode >6 months (200 patients with 1, 68 with 2, 25 with 3, 15 with 4, 27 with ≥5 episodes). The mean observed treatment times considered in the GEE model were 1 year for rituximab, 2.3 years for csDMARDs only and 2.4, 2.4, 2.2 years for treatment with TNF inhibitors, tocilizumab, and abatacept respectively.

Table 2: Adjusted relative risks for deterioration of heart failure or death.

	Relative risk	LCL	UCL
csDMARD	Ref.		
TNF inhibitor	0.7	0.4	1.3
Abatacept	0.8	0.3	2.3
Rituximab	0.5	0.2	1.1
Tocilizumab	0.9	0.3	2.6
Baseline age per 5 years	**1.3**	**1.1**	**1.5**
Male vs. female	**2.4**	**1.4**	**3.9**
C-reactive protein per 5 mg/l	**1.03**	**1.004**	**1.1**
% of physical function per 10 points	**0.9**	**0.8**	**0.999**
Sum of comorbidities	1.1	0.96	1.3
Oral glucocorticoids per 5 mg/d	**1.4**	**1.03**	**1.8**
Smokers vs. non-smokers	**1.7**	**1.02**	**3.0**

Whilst biologic treatment was not associated with the outcome (table 2), male gender, higher age, a higher glucocorticoid dose, worse physical function and elevated CRP (averaged value under treatment) were significantly associated with hospitalization due to HF or death.

If only mortality was examined, very similar results were obtained.

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