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Influence of age and sex on first CDAI remission in rheumatoid arthritis: Results from the Ontario Best Practices Research Initiative

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Background:

Rheumatoid arthritis (RA) is the most common inflammatory rheumatic disease, with a female predominance of approximately 3:1. Females with RA experience more severe functional decline and increased disability than males. The sex-based differences in RA development and progression remain inadequately understood [1]. The onset and progression of RA are also affected by physiological processes, such as menopause and aging [2].

Objectives:

Therefore, we aimed to study the possible influence of age and sex on the time to first CDAI remission of rheumatoid arthritis.

Methods:

This prospective cohort study used a registry database in Ontario, Canada, from 2008 to 2023. Patients were included if they had active RA (≥1 swollen joint), were in moderate or severe status, had started a bDMARD at enrolment or first interview, and had at least one follow-up visit. Knowing the mean age of menopause is 52 years in Canadian women [3], the cohort was divided into four groups: Males and females 52 years and older, males and females under the age of 52. We compared baseline characteristics and time to first remission between the four groups. Remission was defined using the Clinical Disease Activity Index (CDAI ≤2.8). The Multivariable Cox proportional hazards model was used to estimate the time to remission.

Results:

The study included patients (years old): 105 male (<52), 328 male (≥52), 443 female (<52) and 880 female (≥52). At baseline, males ≥52 years were more likely to have a higher proportion of erosions, lower HAQ-DI and pain scores, and were more likely to have reported CVD and diabetes mellitus compared to the other groups. In contrast to the other groups, females ≥52 years were less likely to smoke, to have post-secondary education, and were more likely to report cancer.

The median time to first CDAI remission for females ≥52 years was numerically longer than other categories. However, the CDAI remission rate was statistically different between age and sex categories at 12, 18 and 24 months. In univariate analysis, compared to males <52 years, females ≥ 52 years were significantly less likely to achieve remission (HRs: 0.72; 95% confidence interval [0.55-0.95], p=0.02) (Figure 1). After adjusting for other factors, the likelihood of first remission remained

significantly lower for females ≥52 years (adj HRs: 0.66; 95% confidence interval [0.47-0.93], p=0.02)[Table 1].

Conclusion:

Some age- and sex-dependent differences in the disease trajectory for RA patients were observed. Thus, age and sex of patients must be taken into account by rheumatologists in their treatment strategy.

References:

[1] Mollard E et al, Rheumatology 2018;579(5),798–802
[2] Shah L et al, Cureus. 2020;12(10): e10944.
[3] Costanian et al, Menopause 2018;25(3):265-272

Figure 1. Cumulative hazard functions for first CDAI remission by age and sex category

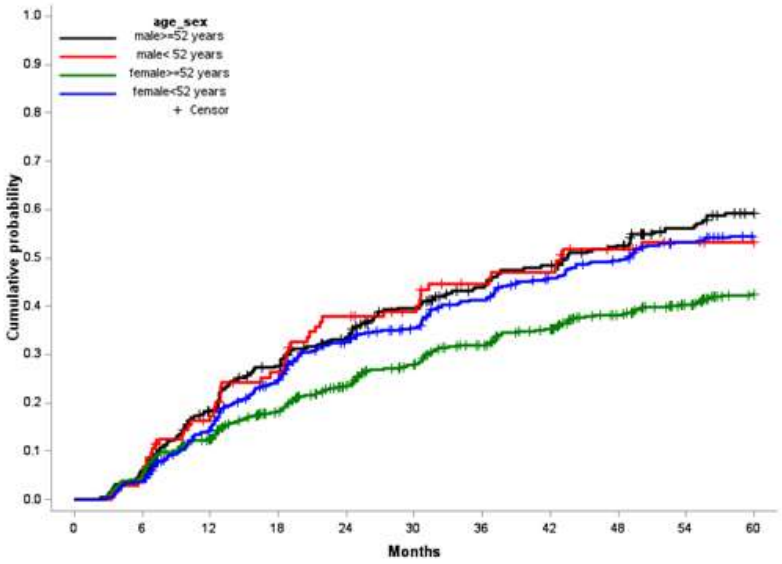

Table 1. Association between age and sex category and time to first remission using Cox proportional hazards regression analysis

	Hazard Ratio (95% Confidence Interval), *p-value*			
	Unadjusted model Event/cohort : 889/1756	**Adjusted model 1 Event/cohort: 635/1171**	**Adjusted model 2 Event/cohort: 635/1171**	**Adjusted model 3 Event/cohort: 621/1145**
male< 52 years	Reference	Reference	Reference	Reference
male ≥ 52 years	1.04 (0.77-1.40), 0.80	0.92 (0.65-1.30), 0.629	0.90 (0.64-1.28), 0.57	0.78 (0.54-1.11), 0.159
female<52 years	0.95 (0.71-1.26), 0.70	0.83 (0.59-1.17), 0.287	0.82 (0.58-1.15), 0.247	0.83 (0.59-1.17), 0.288
female≥52 years	**0.72 (0.55-0.95), 0.02**	**0.66 (0.48-0.92), 0.01**	**0.65 (0.47-0.90), 0.01**	**0.66 (0.47=0.93), 0.02**

Model 1: adjusted for BMI, education, smoking, CDAI at baseline, disease duration, positive RF and presence of erosion, CVD, depression, lung disease, and cancer

Model 2: adjusted model 1 + csDMARDs, bDMARDs use, and oral steroid

Model 3: adjusted model 2+ PROs (HAQ-DI, fatigue, and RADAI)

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Medexus - OBRI
Medreleaf/Aurora - OBRI
Novartis - OBRI and PsA
Pfizer (Hospira) - OBRI and PsA
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