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THE ROLE OF ANGIOPOIETIN-LIKE PROTEINS TYPES 3 AND 4 IN THE DEVELOPMENT OF RENAL DYSFUNCTION IN PATIENTS WITH RHEUMATOID ARTHRITIS

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Background: Rheumatoid arthritis (RA) often contributes to the development of kidney disease. Angiotensin-like proteins can be target markers for studying cardiorenal complications of RA [1].

Objectives: Assessment of the correlation of serum concentrations of angiotensin-like proteins types 3 and 4 (ANGPTL 3 and 4) with the progression of renal dysfunction in RA patients.

Methods: 114 patients with reliable RA (90.4% of women, 9.6% of men) aged 21 to 80 years (mean age 55.4 ± 11.2 years old), disease duration - 11.18 ± 9.03 years, positive for rheumatoid factor (RF-IgM) - 63.2%, positive for anti-citrullinated protein antibody (ACPA) - 59.7% were examined. The laboratory examination included the determination of serum concentrations of angiotensin-like protein type 3 (Human Angiotensin-like Protein 3 ELISA, Bio Vendor, Czech Republic) and type 4 (RayBio Human ANGPTL4 ELISA Kit; RayBiotech, USA). To assess renal function in RA patients we used the calculated glomerular filtration rate (GFR) according to the CKD-EPI formula [2], taking into account the height and weight of a particular patient without indexing by body surface area. GFR values from 60 to 89 ml / min / 1.73 m² - as a slight decrease in global kidney function.

Results: The concentration of ANGPTL3 in the blood serum of RA patients (n = 158) was 641.9 ± 224.5 ng / ml, and that of ANGPTL4 (n = 158) - 3.15 [0.77; 12.1] ng / ml. 74.7% (n = 118) were considered positive for the presence of ANGPTL3; 49.4% (n = 78) of RA patients were recognized as positive for the presence of ANGPTL4. The average glomerular filtration rate in RA patients was 74.0 ± 18.6 ml / min. More than a half of the examined RA patients had GFR ranging from 89 to 60 ml / min / 1.73 m² (C1 - 21.5%; C2 - 58.9%; C3 - 19.6%). No sharp reduce of renal function (GFR <30 ml / min / 1.73 m²) corresponding to CKD C4-5 stages was recorded. Negative correlations of average strength were found between GFR and the level of ANGPTL 3 (r = -0.32, p < 0.001) and ANGPTL 4 (rS = -0.31, p < 0.001), as well as with age (rS = -0.28, p < 0.001), the duration of RA (rS = -0.22, p = 0.005) and blood pressure increase (rS = -0.25, p = 0.001). On the basis of GFR measurements, patients were divided into three groups: group I - optimal renal function (> 90 ml / min); group II - a slight decrease in renal function (89-60 ml / min); group III - reduced renal function (<59 ml / min).

Table 1. Content of ANGPTL 3 and 4 in RA patients with different GFR, ng / ml

	Group I (n=34)	Group II (n=93)	Group III (n=31)
ANGPTL 3	533.4±161.7 ^{I-III}	650.0±223.9	733.2±244.1
ANGPTL 4	0.77 [0.28;3.6] ^{I-II, I-III}	3.3 [0.93;12.1]	6.48 [1.52;19.3]

Note: upper case indicates intergroup differences at p < 0.05.

There was a significant difference in the content of ANGPTL3 in patients of the first group and the patients of the third group (H-test = 6.55, p = 0.032) and ANGPTL4 in the group of patients with normal renal function (group I) and groups of RA patients with decreased GFR (group I-II: H-test = 10.7, p = 0.001; groups I-III: H-test = 20.1, p < 0.001). ANGPTL4 indices also had intergroup differences (groups II-III: H-test = 7.2, p = 0.007) with GFR less than 90 ml / min.

Conclusion: Chronic rheumatoid inflammation potentiates the development of renal dysfunction according to our data in 78.5% of patients. It is also accompanied by an increase in the content of ANGPTL types 3 and 4 in the blood of RA patients. A better understanding of the actions and mechanisms of ANGPTL may be of paramount importance for the development of effective ways of treatment for cardiorenal complications in RA.

REFERENCES:

- Aleksandrov A., Aleksandrov V., Shilova L. Study of the role of angiotensin-like protein type 4 in metabolic disorders caused by inflammation in rheumatoid arthritis. *Ann Rheum Dis.* 2020;79(s1):1341. doi: 10.1136/annrheumdis-2020-eular.4558.
- KDIGO 2012 clinical practice guideline for the evaluation and management of chronic kidney disease. *Kidney Int Suppl.* 2013;3:1-150.

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IS TEA CONSUMPTION ASSOCIATED WITH RISK OF RHEUMATOID ARTHRITIS?

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Background: Only few studies have looked at the association between tea consumption and risk of rheumatoid arthritis (RA) with inconclusive results.

Objectives: To estimate the association between tea consumption and risk of RA in a large population-based case-control study.

Methods: We used data from the Swedish Epidemiological Investigation of RA (EIRA), a population-based case-control study including incident RA cases with 2 controls randomly matched from the general population, based on age, sex and residential area at the date of diagnosis. All participants filled in a comprehensive questionnaire on lifestyle factors, including a 124-item food frequency questionnaire (FFQ). Data from October 2005 - May 2018 was used.

Odds ratios (ORs) with 95% confidence intervals (CIs) were estimated using conditional logistic regression, overall and stratified by anti-citrullinated protein antibody (ACPA) and smoking status. We adjusted for smoking status, coffee and alcohol consumption, educational level and BMI. The dose-response trend of the association between tea consumption and risk of rheumatoid arthritis was estimated using restricted cubic spline with knots at 0, 0.29, and 2.29 cups per day. Missing tea values (44.8%) were imputed based on the zero-consumption assumption. A sensitivity analysis was performed to evaluate the influence of the assumption on the main result, with 70% of the missing randomly imputed as no consumption, and the remaining 30% randomly assigned to the other categories (10% per category).

Results: We included 2237 cases and 4661 controls. Controls were more likely to drink ≥2 tea cups/day compared to RA cases (22.1% vs. 19.7%). The crude odds of developing RA was 22% lower (OR=0.78, 95% CI: 0.66-0.92) among those who consumed ≥2 tea cups/day compared to those who drank <1 cup/day (irregular drinkers). After adjustment for covariates, the inverse association was less pronounced and only borderline significant (OR=0.85, 95% CI: 0.71-1.01). A similar OR was observed among non-tea consumer (OR=0.82, 95% CI: 0.70-0.95). The odds of developing ACPA positive RA (but not ACPA negative) was statistically significant lower among participants drinking ≥2 cups/day compared to irregular tea drinkers (OR=0.76, 95% CI: 0.62-0.94). In analyses stratified by smoking, an inverse association between tea intake and RA was found only among current smokers (OR=0.58, 95% CI: 0.37-0.92), while no association was found in never smoker. The sensitivity analysis showed results similar to the main analysis, although the OR in the no consumption category was not significant (OR=0.88, 95% CI: 0.76-1.02) while the OR in the highest category was statistically significant (OR=0.85, 95% CI: 0.73-0.99).

Overall tea consumption				
	0 cups/day	<1 cup/day	1-2 cups/day	≥2 cups/day
Overall				
Number	955/1941	453/847	388/845	441/1028
OR crude*	0.89 (0.77-1.03)	Ref	0.84 (0.71-1.00)	0.78 (0.66-0.92)
OR adjusted†	0.82 (0.70-0.95)	Ref	0.87 (0.73-1.04)	0.85 (0.71-1.01)
ACPA positive				
Number	637/1156	321/527	268/501	277/630
OR adjusted	0.81 (0.67-0.97)	Ref	0.88 (0.71-1.09)	0.76 (0.62-0.94)
ACPA negative				
Number	312/571	129/221	119/251	162/288
OR adjusted	0.87 (0.66-1.14)	Ref	0.87 (0.63-1.19)	1.07 (0.78-1.46)
Never smokers				
Number	290/859	164/436	142/433	213/563
OR adjusted	0.90 (0.72-1.14)	Ref	0.88 (0.68-1.15)	1.04 (0.81-1.33)
Current smokers				
Number	296/371	89/96	59/78	59/99
OR adjusted	0.81 (0.57-1.14)	Ref	0.83 (0.52-1.31)	0.58 (0.37-0.92)

Figure 1. Dose-response odds ratio for risk of rheumatoid arthritis (RA) by tea consumption.