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The impact of smoking on the activity of rheumatoid arthritis

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ABSTRACT

Smoking is the environmental factor involved in rheumatoid arthritis etiopathology. The data from the literature show that the smoking influence both the appearance and the development of rheumatoid arthritis. The study aims to analyze how smoking affects disease activity.

A prospective study was conducted on a sample of 264 rheumatoid arthritis patients who were registered with the Department of Rheumatology at the Medical Clinic II, Clinical Emergency Hospital “St. Andrew”, Constanta. We performed demographic variables, clinical and biological. We specifically inquired smoking status and parameters of disease activity variables expressed by DAS₂₈ and its variables.

Smoking status was correlated with high and moderate active disease and ESR values and patient global assessment. No statistically significant correlation with CRP, tender joint count, swollen joint count.

In conclusion, smoking influences disease activity.

Keywords: rheumatoid arthritis, smoking, DAS₂₈

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Introduction

Rheumatoid arthritis (RA) represents 10% of all rheumatic diseases and is the most common type of inflammatory rheumatism, with an annual incidence of 30/100000 inhabitants [1].

The etiology of RA are incriminated genetic factors, autoimmune, infectious agents and environmental factors (oral contraceptives, smoking).

The role of smoking in the etiology and evolution of AR began to be studied 25 years ago, when Vessey et al published a cohort study that aimed to examine the association between AR and use of oral contraceptives in women 78 England. Surprisingly, the study reported an association between smoking and hospitalization of patients with RA [2].

There followed numerous cohort studies that have attempted to clarify how the smoking habits influence the development and progression.

Both women and men smokers have a higher relative risk of developing RA compared with those who never smoked [3,4].

Smoking is associated with early onset of the disease [5].

Smokers of both sexes have an increased risk of developing RA seropositive [6].

Smoking is associated with increased disease activity and impairment [6], but does not affect radiological progression [5].

Some studies correlate smoking with the emergence of a large number of extra-articular manifestations [7, 8, 9].

Studies in recent years aim in particular how smoking affects the response to therapy. They have shown that smoking lowers potent of the disease-modifying medicines so that smokers's doses required to control the disease are increased and thus increase the risk of side effects [10].

Aim

The aim of the study is to examine how smoking affects disease activity in RA patients from Constanța. This study is a continuation of the presentation of the A-XXVIII National Conference of Physiology - Constanța 28 to 30 May 2015.

Material and methods

Were analyzed a total of 264 patients with a confirmed diagnosis of RA who were registered with the Department of Rheumatology, Medical Clinic II Clinical Emergency Hospital "St. Andrew" Constanța.

We were interested in demographic data (age, sex, area of origin), the history of AR (age at onset, disease duration) disease characteristics (seropositivity, stage, degree of activity), but also by smoking habits.

In daily practice, the activity of RA is expressed by score DAS28 (Disease Activity Score with 28 joints). DAS28 calculation formula includes 4 variables: the number of tender joints, number of swollen joints, patient global assessment, and the ESR or CRP. The joints 28 counted in the DAS28 score are the proximal interphalangeal joints (10), the metacarpophalangeal joints (10), the wrists (2), the

elbows (2), the shoulders (2) and the knees (2).

Depending on the value DAS28, can be highly active RA (>5.1), moderately active RA (3.1-5.1), RA with low activity (2.6-3.1) or RA in remission (> 5.1).

We entered the information into a database using the Microsoft Office Excel software. We used MedCalc software to calculate odds ratios to assess differences between smokers and nonsmokers. We considered statistically significant $p < 0.05$.

Results

In the study group we included 264 RA patients confirmed. We observed a higher frequency of female patients compared to males. Median age is 62.30 years, with a mean age of disease onset 51.60 years. Most patients are from urban areas.

Most patients have seropositive RA stage III or IV, with extra-articular manifestation, with a high or moderate activity (tabel I and tabel II).

Table I - Characteristics of the patients

Age (median) (years)	62.30
Genter B:F	37:227 (0.16)
Urban area : Rural area	54:210(0.25)
The average age at onset	51.60
Seropositive patients	214 (81%)
Patients with extra-articular manifestation	178 (67%)
Patients with erosions	210 (75%)
Patients with ankylosis (Stage IV)	94 (35%)

Table II - The activity of disease in patients

Disease activity	Number of patients/ percentage
Remission	38 (14%)
Low activity	31(12%)
Moderate activity	104 (39%)
High activity	91 (34%)

Concerning smoking habits, we formed two populations: exposure to smoking (82 patients) and not exposed to smoking (182 patients). Among 82 patients exposed to smoking, 24 patients were smoking at onset and continue to smoke today, 34 patients were smoking at onset and subsequently stopped smoking, 3 patients did not smoke at onset and subsequently started smoke, and 21 patients did not smoke at onset, started smoking after disease onset and subsequently stopped smoking.

We conducted correlation between smoking status (ever, onset and current) and DAS28 and its components (tender joint count, swollen joint count, patient global assessment and ESR / CRP).

Ever smoking status statistically correlated with the value of ESR and DAS28 > 5.1 (high activity) and current smoking status was correlated with the amount of patient global assessment and DAS28 for moderate activity (Tabel III, Tabel IV and Tabel V).

Table III - Correlations between exposure to smoking and DAS28 and its variables

	Exposed to Smoking	Non-exposed to Smoking	p
ESR	42/40	120/62	0.0239
CRP	40/42	108/74	0.1106
Tender joint count	21/61	62/120	0.1723
Swollen joint count	7/75	6/176	0.0789
Patient global assessment	44/38	101/81	0.7815
Remission	13/69	25/157	0.6504
Low activity	11/71	20/164	0.5509
Moderate activity	37/47	69/113	0.4632
High activity	22/61	69/113	0.0425

Table IV - Correlation between onset smoking status and DAS28 and its variables

	Smokers at onset	Non-smokers at onset	p
ESR	34/40	128/78	0.6274
CRP	27/31	121/85	0.1002
Tender joint count	13/45	70/136	0.0965
Swollen joint count	4/54	9/197	0.4359
Patient global assessment	33/25	112/94	0.7326
Remission	7/51	31/175	0.5688
Low activity	9/49	22/186	0.3027
Moderate activity	27/31	77/129	0.2079
High activity	15/44	76/130	0.6063

Table V - Correlations between current smoking status and DAS28 and its variables

	Current smokers	Current non-smokers	p
ESR	13/14	117/120	0.9045
CRP	15/12	133/104	0.9555
Tender joint count	8/19	75/162	0.8308
Swollen joint count	3/24	10/227	0.1320
Patient global assessment	20/7	125/112	0.0257
Remission	2/25	36/201	0.2869
Low activity	1/26	30/209	0.2043
Moderate activity	16/11	88/149	0.0295
High activity	9/19	82/155	0.6063

Discussions

RA association with smoking is a hot topic, with studies looking at the influence of smoking on the incidence, clinical and laboratory manifestations

of RA. In our country, there is only one article in 2011 that studies influence of smoking on response to treatment.

A study in Oxford University observed for 2 years in patients with RA smokers or former smokers smoking, following disease activity in number of tender joints, number of swollen joints, visual analogue scale (VAS) and appearance/evolution erosion. The number of tender joints, number of swollen joints and visual analogue scale were higher in smokers than in nonsmokers, but smoking did not affect radiological progression [11].

In patients with early RA, smoking is associated with increased disease activity (number of tender joints, number of swollen joints, DAS28), and severe disease [12], but does not affect the radiological progression [5].

There are studies that say that smoking does not affects DAS28 and radiological scores, but that smokers require disease-modifying treatments (DMARDs) in higher doses, which would indicate that smoking reduces the potency of these drugs [13].

The current study showed that smoking influences disease activity, both objective (DAS28 and ESR) and subjective parameters (patient global assessment).

Conclusion

Smoking is a environment risk factor involved in the etiology of RA and the only one how can be changed.

Smoking influences the evolution of AR in a negative way; the disease is more aggressive in patients exposed to smoking.

Is important informing the population about the role of smoking in the development of AR. Rheumatologist role is to inform patients with AR on the evolution of the treated disease. National programs should be initiated to support patients who decide to quit smoking.

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