High Prevalence of Thyroid Autoimmunity and Hypothyroidism in Patients with Psoriatic Arthritis

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ABSTRACT. ***Objective.*** To evaluate the prevalence of thyroid disorders in a group of patients with psoriatic arthritis (PsA).

Methods. A complete thyroid investigation was carried out in 80 patients with PsA, in gender- and age-matched subjects (1:5) drawn from the general population (controls), and in 112 patients with rheumatoid arthrtitis (RA) with similar iodine intake.

Results. Anti–thyroid peroxidase antibodies (AbTPO), a hypoechoic thyroid, and subclinical hypothyroidism were significantly more frequent in women with PsA than in control women, and their frequency was similar to that in patients with RA (positive AbTPO titer 28%, 12%, and 31%; hypoechoic thyroid 31%, 16%, and 36%; subclinical hypothyroidism 25%, 8%, and 12%, respectively). Among men, positive AbTPO titers and a hypoechoic thyroid were found more frequently in the patients with PsA and RA than in controls (positive AbTPO titer 14%, 5%, and 2%; hypoechoic thyroid 16%, 10%, and 3%, respectively). All patients with PsA with subclinical hypothyroidism had polyarticular involvement ($p < 0.05$) and a longer disease duration (years 19 ± 15 vs 11 ± 8, $p = 0.03$) than patients with euthyroid PsA. The prevalence of subclinical hyperthyroidism, thyroid nodules, and thyroid enlargement was not significantly different among the 3 groups.

Conclusion. Our results demonstrate a significantly higher prevalence of thyroid autoimmunity (positive AbTPO, hyoechoic thyroid) findings in men and women with PsA and of subclinical hypothyroidism in women with PsA than in the general population. Therefore, thyroid function tests, an AbTPO assay, and thyroid ultrasound should be performed as part of the clinical evaluation, particularly in women with PsA. (First Release Aug 1 2006; J Rheumatol 2006;33:2026–8)

Key Indexing Terms:
PSORIATIC ARTHRITIS RHEUMATOID ARTHRITIS THYROID AUTOIMMUNITY
HYPOTHYROIDISM THYROID CANCER

Data regarding thyroid involvement in psoriatic arthritis (PsA) are lacking[1]. We therefore evaluated the prevalence of thyroid disorders in a group of patients with PsA.

MATERIALS AND METHODS

Study patients. Eighty patients with PsA (according to the criteria of Vasey and Espinoza) were recruited into the study[2]. Disease activity was assessed by American College of Rheumatology joint count, C-reactive protein level, health assessment questionnaire, duration of morning stiffness, and presence of spinal and nocturnal pain[3].

Control groups. We enrolled 2 control groups: (1) 112 patients with rheumatoid arthritis (RA) according to American Rheumatology Association classification criteria[4]; and (2) and 400 control subjects whose level of iodine intake was known; each patient with PsA was matched by sex and age with 5 of these subjects, who were from a cohort of 1,640 residents living in the same geographic area. Subjects with a history of rheumatic diseases were excluded.

Study protocol. All patients and controls underwent a complete clinical evaluation. Thyroid sonography (Esaote AU5 with a sectorial 7.5 MHz transducer) was performed in all subjects by a single physician, blinded to laboratory findings, who evaluated the following: thyroid volume[5-7]; thyroid tissue abnormalities, scored as reported by Antonelli, *et al*[6,7]; and presence of thyroid nodules. Biopsy samples were obtained from nodules with a diameter > 10 mm.

Thyroid blood flow (TBF) was studied by color-flow Doppler (CFD). CFD pattern was defined according to Vitti, *et al*[8]. Serum levels of thyroid stimulating hormone (TSH) (RIA kit, DiaSorin, Stillwater, MN, USA), free triiodothyronine (FT_3), free thyroxine (FT_4) (RIA kits, Amerlex-Mab FT_3/FT_4 Kit, Amersham, UK) and anti–thyroglobulin antibody (AbTg) and anti–thyroid peroxidase antibody (AbTPO) titers (both by IRMA, ICN Pharmaceuticals, Costa Mesa, CA, USA) were evaluated.

The study was approved by the ethics committee and all subjects gave their informed written consent.

Statistical analysis. Because of the different female:male ratios in the PsA and RA groups and since female gender is a well-recognized risk factor for thyroid disorders, levels of TSH, FT3, FT4, AbTPO, and AbTg were compared only among participants of the same gender. Mean group values were compared using one-way analysis of variance (ANOVA) for normally distributed variables. Proportions were compared by the chi-squared test. *Post hoc* com-

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parisons on normally distributed variables were carried out using the Bonferroni-Dunn test.

RESULTS

Demographic characteristics of the PSA, RA, and control groups are shown in Table 1. Among patients with PsA, 58 had symmetric polyarthritis, 20 asymmetric oligoarthritis, and 2 spondylitis[9]. Most of the participants were permanent residents in an iodine-deficient area, with no significant difference among the 3 groups.

Results in female patients and controls. The mean TSH levels and AbTPO titers were significantly higher in patients with PsA than in controls (Table 2). Subclinical hypothyroidism (TSH > 3.5 μU/ml, with FT_4 and FT_3 within the normal range), AbTPO positivity, and thyroid hypoechogenicity were significantly more frequent in PsA than in controls. Indices of thyroid autoimmunity, namely AbTg or AbTPO positivity or ultrasonographic diagnosis of thyroiditis (diagnosed by ultrasonography in the absence of positive AbTg or AbTPO in 2 women with PsA, 3 with RA, and in 2 controls), were significantly more frequent in patients with PsA than in controls (Table 2). No statistically significant difference in the prevalence of subclinical hyperthyroidism (TSH < 0.2 μU/ml with FT_4 and FT_3 within normal range) was observed among patients from the 3 groups (Table 2). Compared to controls, the odds ratio, OR, (95% confidence interval, CI) for patients with PsA was 3.7 (1.5-9.1) for subclinical hypothyroidism, 2.8 (1.2–6.4) for AbTPO positivity, and 3.2 (1.1-4.9) for thyroid autoimmunity.

A hypoechoic pattern and significantly higher serum AbTPO titers were detected more frequently in patients with RA than in controls (Table 2). Compared to controls the OR (95% CI) for patients with RA was 3.2 (1.7-6.0) for AbTPO positivity and 3.2 (1.8-5.6) for thyroid autoimmunity.

Results in male patients and controls. Positive AbTPO titers, hypoechoic thyroid, and thyroid autoimmunity (diagnosed by ultrasonography in the absence of positive AbTg or AbTPO in 1 with PsA, 1 with RA, and in 2 controls) were significantly more frequent in patients with PsA than in controls (Table 3). Compared to controls, OR (95% CI) for patients with PsA was 3.2 (1.8-5.6) for AbTPO positivity and 3.1 (1.8-5.6) for thyroid autoimmunity.

General results. In each group thyroid disorders of any kind had a higher prevalence in women than in men, with the exception of thyroid enlargement, which was physiologically more frequent in men (Tables 2 and 3)[5-7,10,11].

All patients with PsA with subclinical hypothyroidism had polyarticular involvement ($p < 0.05$) and a longer disease duration than other patients with PsA (19 ± 15 vs 11 ± 8 years, $p = 0.0352$). No relationship between PsA disease activity and

Table 1. Demographic characteristics of patients with psoriatic arthritis (PsA), patients with rheumatoid arthritis (RA), and the general population (controls).

Variable	PsA n = 80	Controls n = 400	RA n = 112	p
Age, yrs	57 ± 11	58 ± 7	59 ± 16	NS
Female (%)	36 (45)	180 (45)	91 (81)*	0.0001
Disease duration, yrs	10 ± 9	—	9 ± 7	NS
Lived in an iodine-deficient area for more than 20 years, %	81	84	75	NS

* $p \leq 0.05$ compared with all other groups by the chi-square test; NS: not significant.

Table 2. Comparison of thyroid status among women from 3 groups: patients with PsA, patients with RA, and controls[e]. Values are mean ± SD or No. (%).

Variable	PsA n = 36	Controls n = 180	RA n = 91	p
Age, yrs	58 ± 10	58 ± 6	59 ± 16	NS
TSH, μU/ml	2.5 ± 2.8[a,b]	1.6 ± 1.7	1.7 ± 2.3	0.0398*
FT_4, ng/dl	0.9 ± 0.3	1.0 ± 0.2	1.1 ± 0.6	NS
FT_3, pg/ml	2.4 ± 0.6	2.7 ± 1.2	2.9 ± 2.2	NS
AbTg, IU/ml	51 ± 70[b]	73 ± 242	240 ± 877[c]	0.0025*
AbTPO, IU/ml	253 ± 660[a]	76 ± 202	234 ± 528[c]	0.0001*
Thyroid volume, ml	11 ± 7	14 ± 14	18 ± 18	NS
TSH > 3.5 μU/ml	9 (25)[e]	15 (8)	11 (12)	0.0147[d]
AbTg+	5 (14)	20 (11)	18 (20)	NS
AbTPO+	10 (28)[e]	22 (12)	28 (31)[f]	0.0006[d]
Hypoechoic pattern	11 (31)[e]	28 (16)	33 (36)[f]	0.0004[d]
Thyroid autoimmunity	12 (33)[e]	33 (18)	38 (42)[f]	0.0001[d]
Thyroid volume > 20 ml	6 (17)	25 (14)	24 (26)[f]	0.0398[d]
Thyroid volume < 6 ml	6 (17)	16 (9)	13 (14)	NS
Thyroid nodules	24 (67)	115 (64)	58 (64)	NS
TSH < 0.2 μU/ml	1 (3)	4 (2)	4 (4)	NS

AbTg+: antithyroglobulin antibodies > 100 IU/ml; AbTPO+: antithyroperoxidase antibodies > 100 IU/ml; thyroid autoimmunity: AbTg+ or AbTPO+ or ultrasonographic diagnosis of thyroiditis. $p \leq 0.05$* by ANOVA; by Bonferroni-Dunn ([a] PsA vs C; [b] PsA vs RA; [c] RA vs C); by chi-square test ([d] all groups; [e] PsA vs C; [f] RA vs C).

Table 3. Comparison of thyroid status among men from the 3 groups: patients with PsA, with RA, or controls. Values are mean ± SD or No. (%).

Variable	PsA n = 44	Controls n = 220	RA n = 21	p
Age, yrs	56 ± 11	58 ± 6	59 ± 16	NS
TSH, μU/ml	1.2 ± 0.9	1.2 ± 1.1	1.4 ± 1.0	NS
FT_4, ng/dl	1.0 ± 0.2	1.0 ± 0.2	1.1 ± 0.4	NS
FT_3, pg/ml	2.5 ± 0.6	2.8 ± 0.6	2.4 ± 1.0	NS
AbTg, IU/ml	42 ± 117	30 ± 110	50 ± 107	NS
AbTPO, IU/ml	47 ± 39	27 ± 122	41 ± 65	NS
Thyroid volume, ml	17 ± 11	21 ± 16	16 ± 6	NS
TSH > 3.5 μU/ml	1 (2)	9 (4)	1 (5)	NS
AbTg+	4 (9)	7 (3)	2 (10)	NS
AbTPO+	6 (14)[b]	4 (2)	1 (5)	0.0010[a]
Hypoechoic pattern	7 (16)[b]	6 (3)	2 (10)	0.0011[a]
Thyroid autoimmunity	11 (25)[b]	10 (5)	4 (19)[c]	0.0001[a]
Thyroid volume > 20 ml	10 (23)	77 (35)	3 (14)	NS
Thyroid volume < 6 ml	0	2 (1)	0	NS
Thyroid nodules	21 (48)	112 (51)	9 (43)	NS
TSH < 0.2 μU/ml	0	4 (1)	0	NS

AbTg+: antithyroglobulin antibodies > 100 IU/ml; AbTPO+: antithyroperoxidase antibodies > 100 IU/ml; thyroid autoimmunity: AbTg+ or AbTPO+ or ultrasonographic diagnosis of thyroiditis. $p \leq 0.05$ by chi-square test ([a] all groups; [b] PsA vs C; [c] RA vs controls).

any thyroid disorders was established. No significant difference in thyroid blood flow was observed between patients with PsA, RA, and controls with autoimmune thyroid disorders. No clinically evident hypo- or hyper-thyroidism was found. In one man with PsA a papillary thyroid cancer was observed.

DISCUSSION

Bianchi, *et al*[1] showed a higher prevalence of thyroid enlargement, raised FT_4, and anti-microsomal antibody positivity in 42 patients with PsA; however, the iodine status of the participants, a major determinant of thyroid volume and function[12], was not considered.

We also found a higher prevalence of thyroid autoimmunity (AbTPO positivity, thyroid hypoechogenicity) in patients with PsA than in controls, independent of age (a major determinat for thyroid autoimmunity)[5-7]. Furthermore, the prevalence of subclinical hypothyroidism was higher in women with PsA than controls or RA[13-15]. Patients with PsA with subclinical hypothyroidism showed a polyarticular involvement and longer disease duration than the other patients with PsA. Thyroid enlargement was associated with thyroid nodules but not with thyroid autoimmunity, suggesting that thyroid enlargement was due mainly to iodine deficiency rather than to autoimmunity[12].

Thyroid function tests and ultrasonography should be performed as part of the clinical profile in high risk patients with PsA (older women, and those with positive AbTPO titers or hypoechoic thyroid).

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