was reached among treating doctors, consulting surgeon and the patient.

Treatment of chronic abdominal angina in patients with atherosclerotic vascular disease classically relies on revascularisation.[6] No effective medical treatment exists. Our observations constitute the first report on the clinical efficacy of prolonged anticoagulation in a patient with abdominal angina and coeliac artery stenosis. Although coeliac artery stenosis was still present 10 months after the introduction of anticoagulation, clinical signs improved and completely resolved 2 years later. As in renal artery stenosis, warfarin with a target INR of 3.0–4.0 may be considered in patients with coeliac artery stenosis and APS.

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Evaluation of allele frequencies in the *PADI4* gene and anti-cyclic citrullinated peptide antibodies of patients with rheumatoid arthritis in a Japanese population

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A case–control linkage disequilibrium study in a Japanese population showed that the peptidyl arginine deiminase type 4 (*PADI4*) is a susceptibility locus for rheumatoid arthritis ($p<0.05$).[1] Ikari *et al*[2] also showed an association of the *PADI4* haplotype with rheumatoid arthritis in an independent Japanese study, but the relationship between the level of anti-cyclic citrullinated peptide (anti-CCP) antibodies and the haplotype has not been shown. Barton *et al*[3 4] and Caponi *et al*[5] could not validate the association in the UK or Caucasian French populations. The purpose of this study was to ascertain the relationship between levels of anti-CCP antibodies and *PADI4* allele frequencies in a Japanese population.

Of the 122 patients with rheumatoid arthritis, most were women (78.9%), the mean patient age was 56 (range 19–83 years) and 77.1% were positive for rheumatoid factor. The allele frequencies of four exonic single-nucleotide polymorphisms (SNPs; padi4_89*G/A, padi4_90*T/C, padi4_92*G/C and padi4_104*T/C) and one intronic SNP (padi_94*T/C) were investigated. The serum levels of anti-CCP antibodies were measured in these patients. The associations between anti-CCP antibodies and the five SNPs were tested using the χ^2 test. One-way analysis of variance and the Bartlett test were used to determine statistical differences in levels of anti-CCP antibodies between intronic and exonic genotypes.

Anti-CCP antibodies were positive in 99 (81.2%) patients. The five SNPs were not associated with the presence of anti-CCP antibodies. The mean levels of anti-CCP antibodies were between 249.5 and 485.8 U/ml in each SNP. No association between levels of anti-CCP antibody and the five SNPs was seen. Similarly, the five SNPs were not associated with the presence of rheumatoid factor (table 1).

The allele frequencies of patients were comparable to those in a UK population.[3 4] Mori *et al*[6] showed that SNPs in *PADI4* had similar allele frequency among Caucasian, African-descent and Japanese populations. Suzuki *et al*[1] reported that a functional haplotype affects the stability of transcripts of *PADI4* and is associated with the presence of anti-CCP antibodies in 123 patients. However, they could not show an association of the susceptible allele frequencies with the levels of anti-CCP antibodies in 122 cases. The result was consistent with the UK study.[3 4] The discrepancy between our study and the previous Japanese studies[1 2] may be a result of the distribution of patients. In Japan, doctors and orthopaedic surgeons treat patients with rheumatoid arthritis in outpatient clinics. Patients with severe symptoms are often treated in the department of internal medicine rather than in the department of orthopaedic surgery, which may cause a bias in the Japanese studies. In our study, showing an association of the *PADI4* haplotype with rheumatoid arthritis, but without levels of anti-CCP in a Japanese population, other genes near *PADI4* may have an association with rheumatoid arthritis.

Patients with severe symptoms may show an association with a susceptibility haplotype on further investigation. The mechanism of collaboration between *PADI4* and other genes may be elucidated in the pathogenesis of rheumatoid arthritis.

Abbreviations: CCP, cyclic citrullinated peptide; PADI4, peptidyl arginine deaminase type 4; SNP, single-nucleotide polymorphism

Table 1 Analysis of genotype frequencies and levels of anti-cyclic citrullinated peptide antibodies in patients with rheumatoid arthritis

		RF	CCP	
SNP ID	Patients	Positive (%)	Positive (%)	Mean (SD, range) (U/ml)
padi_89				
1/1	46 (37.7)	36 (38.3)	38 (38.4)	401.7 (442.8, 10.9–1860.0)
1/2	49 (40.2)	39 (41.5)	40 (40.4)	260.3 (328.0, 6.5–1310.0)
2/2	27 (22.1)	19 (20.2)	21 (21.2)	270.4 (434.9, 8.0–1860.0)
		p=0.64	p=0.87	p(B) = 0.15; p*=0.24
padi_90				
1/1	48 (37.5)	35 (37.2)	37 (37.4)	411.8 (444.0, 10.9–1860.0)
1/2	50 (41.0)	40 (42.6)	41 (41.4)	254.7 (254.7, 6.5–1310.0)
2/2	27 (22.1)	19 (20.2)	21 (21.2)	270.4 (434.9, 8.0–1860.0)
		p=0.62	p=0.88	p(B) = 0.13; p*=0.19
padi_92				
1/1	48 (39.3)	37 (39.4)	40 (40.4)	388.3 (436.2, 8.3–1860.0)
1/2	49 (40.2)	39 (41.5)	40 (40.4)	260.3 (260.3, 6.5–1310.0)
2/2	25 (20.5)	18 (19.1)	19 (19.2)	284.7 (454.0, 8.0–1860.0)
		p=0.76	p=0.74	p(B) = 0.14; p*=0.34
padi_94				
1/1	46 (37.7)	36 (38.3)	38 (38.4)	401.7 442.8 (10.9–1860.0)
1/2	49 (40.2)	39 (41.5)	40 (40.4)	260.3 260.3 (6.5–1310.0)
2/2	27 (22.1)	19 (20.2)	21 (21.2)	270.4 434.9 (8.0–1860.0)
		p=0.64	p=0.87	p (B) = 0.15; p*=0.25
padi_104				
1/1	52 (42.6)	40 (42.6)	41 (41.4)	385.8 (433.2, 10.9–1860.0)
1/2	52 (42.6)	40 (42.6)	42 (42.4)	249.5 (249.5, 6.5–1310.0)
2/2	18 (14.8)	14 (14.9)	16 (16.2)	316.5 (485.8, 8.3–1860.0)
		p=1.0	p=0.65	p(B) = 0.08; p*=0.30

CCP, cyclic citrullinated peptide; RF, rheumatoid factor; SNP, single-nucleotide polymorphism.
p, χ^2 test; p(B), Bartlett test; p*, one-way analysis.
The common allele was always referred to as allele 1 and the rare allele as allele 2.

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Ethical approval: The Graduate School of Medicine, Chiba University, has approved the protocol for this investigation on humans, and all investigations were conducted in conformity with ethical principles of research.

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