

**“The diagnostic accuracy of anti-CCP antibody in rheumatoid arthritis:
Impact of reporting quality on pooled diagnostic estimates”**

All papers included in final analysis

- [1] Abdel-Nasser AM, Mahmoud MH, El Mansoury TM, Osman AM. Anti-CCP2 is an adjunct to, not a surrogate for, rheumatoid factor in the diagnosis of rheumatoid arthritis: diagnostic utility of anti-CCP2 antibodies in Egyptian patients with rheumatoid arthritis. *Scand J Rheumatol* 2008;37(5):329-36.
- [2] Aflaky E, Shenavandeh S, Ashraf MJ. A comparison of performance of anti-cyclic citrullinated peptide 2 and citrullinated protein antibodies in the diagnosis of rheumatoid arthritis in Iranian patients. *Rheumatol Int* 2010;30(4):461-6.
- [3] Aigner E, Schmid I, Osterreicher CH, Zwerina J, Schett G, Strasser M, Niksic F, Hohla F, Ramsauer T, Dorn U, Patsch W, Datz C. Contribution of anti-cyclic citrullinated peptide antibody and rheumatoid factor to the diagnosis of arthropathy in haemochromatosis. *Ann Rheum Dis* 2007;66(9):1249-51.
- [4] Alexiou I, Germenis A, Ziogas A, Theodoridou K, Sakkas LI. Diagnostic value of anti-cyclic citrullinated peptide antibodies in Greek patients with rheumatoid arthritis. *BMC Musculoskelet Disord* 2007;8:37.
- [5] Amezcua-Guerra LM, Springall R, Marquez-Velasco R, Gomez-Garcia L, Vargas A, Bojalil R. Presence of antibodies against cyclic citrullinated peptides in patients with 'rhupus': a cross-sectional study. *Arthritis Res Ther* 2006;8(5):R144.
- [6] Aotsuka S, Okawa-Takatsuji M, Nagatani K, Nagashio C, Kano T, Nakajima K, Ito K, Mimori A. A retrospective study of the fluctuation in serum levels of anti-cyclic citrullinated peptide antibody in patients with rheumatoid arthritis. *Clin Exp Rheumatol* 2005;23(4):475-81.
- [7] Ates A, Karaaslan Y, Aksaray S. Predictive value of antibodies to cyclic citrullinated peptide in patients with early arthritis. *Clin Rheumatol* 2007;26(4):499-504.
- [8] Atta AM, Carvalho EM, Jeronimo SM, Sousa Atta ML. Serum markers of rheumatoid arthritis in visceral leishmaniasis: rheumatoid factor and anti-cyclic citrullinated peptide antibody. *J Autoimmun* 2007;28(1):55-8.
- [9] Awwad HM, Aboukhamis I. Diagnostic performances of anti-cyclic citrullinated peptide antibodies type IgM, IgA and IgG in Syrian patients with rheumatoid arthritis. *Clin Lab* 2010;56(3-4):95-102.

- [10] Bassyouni IH, Ezzat Y, Hamdy S, Talaat RM. Clinical significance of anti-cyclic citrullinated peptide antibodies in Egyptian patients with chronic hepatitis C virus genotype IV infection. *Clin Chem Lab Med* 2009;47(7):842-7.
- [11] Bizzaro N, Tonutti E, Tozzoli R, Villalta D. Analytical and diagnostic characteristics of 11 2nd- and 3rd-generation immunoenzymatic methods for the detection of antibodies to citrullinated proteins. *Clin Chem* 2007;53(8):1527-33.
- [12] Bombardieri M, Alessandri C, Labbadia G, Iannuccelli C, Carlucci F, Riccieri V, Paoletti V, Valesini G. Role of anti-cyclic citrullinated peptide antibodies in discriminating patients with rheumatoid arthritis from patients with chronic hepatitis C infection-associated polyarticular involvement. *Arthritis Res Ther* 2004;6(2):R137-41.
- [13] Candia L, Marquez J, Gonzalez C, Santos AM, Londono J, Valle R, Zabaleta J, Yaqub Z, Espinoza LR. Low frequency of anticyclic citrullinated peptide antibodies in psoriatic arthritis but not in cutaneous psoriasis. *J Clin Rheumatol* 2006;12(5):226-9.
- [14] Ceccato F, Roverano S, Barrionuevo A, Rillo O, Paira S. The role of anticyclic citrullinated peptide antibodies in the differential diagnosis of elderly-onset rheumatoid arthritis and polymyalgia rheumatica. *Clin Rheumatol* 2006;25(6):854-7.
- [15] Chibnik LB, Mandl LA, Costenbader KH, Schur PH, Karlson EW. Comparison of threshold cutpoints and continuous measures of anti-cyclic citrullinated peptide antibodies in predicting future rheumatoid arthritis. *J Rheumatol* 2009;36(4):706-11.
- [16] Choi SW, Lim MK, Shin DH, Park JJ, Shim SC. Diagnostic performances of anti-cyclic citrullinated peptides antibody and antiflaggrin antibody in Korean patients with rheumatoid arthritis. *J Korean Med Sci* 2005;20(3):473-8.
- [17] Coenen D, Verschueren P, Westhovens R, Bossuyt X. Technical and diagnostic performance of 6 assays for the measurement of citrullinated protein/peptide antibodies in the diagnosis of rheumatoid arthritis. *Clin Chem* 2007;53(3):498-504.
- [18] Correia ML, Carvalho S, Fortuna J, Pereira MH. Comparison of three anti-CCP antibody tests and rheumatoid factor in RA and control patients. *Clin Rev Allergy Immunol* 2008;34(1):21-5.
- [19] Damjanovska L, Thabet MM, Levarth EW, Stoeken-Rijsbergen G, van der Voort EI, Toes RE, Huizinga TW, van der Helm-van Mil AH. Diagnostic value of anti-MCV antibodies in differentiating early inflammatory arthritis. *Ann Rheum Dis* 2010;69(4):730-2.

- [20] De Rycke L, Peene I, Hoffman IE, Kruithof E, Union A, Meheus L, Lebeer K, Wyns B, Vincent C, Mielants H, Boullart L, Serre G, Veys EM, De Keyser F. Rheumatoid factor and anticitrullinated protein antibodies in rheumatoid arthritis: diagnostic value, associations with radiological progression rate, and extra-articular manifestations. *Ann Rheum Dis* 2004;63(12):1587-93.
- [21] de Seny D, Fillet M, Meuwis MA, Geurts P, Lutteri L, Ribbens C, Bours V, Wehenkel L, Piette J, Malaise M, Merville MP. Discovery of new rheumatoid arthritis biomarkers using the surface-enhanced laser desorption/ionization time-of-flight mass spectrometry ProteinChip approach. *Arthritis Rheum* 2005;52(12):3801-12.
- [22] Dejaco C, Klotz W, Larcher H, Duftner C, Schirmer M, Herold M. Diagnostic value of antibodies against a modified citrullinated vimentin in rheumatoid arthritis. *Arthritis Res Ther* 2006;8(4):R119.
- [23] dos Anjos LM, Pereira IA, d'Orsi E, Seaman AP, Burlingame RW, Morato EF. A comparative study of IgG second- and third-generation anti-cyclic citrullinated peptide (CCP) ELISAs and their combination with IgA third-generation CCP ELISA for the diagnosis of rheumatoid arthritis. *Clin Rheumatol* 2009;28(2):153-8.
- [24] Dubucquoi S, Solau-Gervais E, Lefranc D, Marguerie L, Sibilia J, Goetz J, Dutoit V, Fauchais AL, Hachulla E, Flipo RM, Prin L. Evaluation of anti-citrullinated filaggrin antibodies as hallmarks for the diagnosis of rheumatic diseases. *Ann Rheum Dis* 2004;63(4):415-9.
- [25] Eshed I, Feist E, Althoff CE, Hamm B, Konen E, Burmester GR, Backhaus M, Hermann KG. Tenosynovitis of the flexor tendons of the hand detected by MRI: an early indicator of rheumatoid arthritis. *Rheumatology (Oxford)* 2009;48(8):887-91.
- [26] Ezzat WM, Raslan HM, Aly AA, Emara NA, El Menyawi MM, Edrees A. Anti-cyclic citrullinated peptide antibodies as a discriminating marker between rheumatoid arthritis and chronic hepatitis C-related polyarthropathy. *Rheumatol Int* 2009.
- [27] Fernandez-Suarez A, Reneses S, Wichmann I, Criado R, Nunez A. Efficacy of three ELISA measurements of anti-cyclic citrullinated peptide antibodies in the early diagnosis of rheumatoid arthritis. *Clin Chem Lab Med* 2005;43(11):1234-9.
- [28] Fusconi M, Vannini A, Dall'Aglio AC, Pappas G, Cassani F, Ballardini G, Frisoni M, Grassi A, Bianchi FB, Zauli D. Anti-cyclic citrullinated peptide antibodies in type 1 autoimmune hepatitis. *Aliment Pharmacol Ther* 2005;22(10):951-5.

- [29] Garcia-Berrocal B, Gonzalez C, Perez M, Navajo JA, Moreta I, Davila C, Gonzalez-Buitrago JM. Anti-cyclic citrullinated peptide autoantibodies in IgM rheumatoid factor-positive patients. *Clin Chim Acta* 2005;354(1-2):123-30.
- [30] Girelli F, Foschi FG, Bedeschi E, Calderoni V, Stefanini GF, Martinelli MG. Is Anti Cyclic citrullinated peptide a useful laboratory test for the diagnosis of rheumatoid arthritis? *Eur Ann Allergy Clin Immunol* 2004;36(4):127-30.
- [31] Greiner A, Plischke H, Kellner H, Gruber R. Association of anti-cyclic citrullinated peptide antibodies, anti-citrullin antibodies, and IgM and IgA rheumatoid factors with serological parameters of disease activity in rheumatoid arthritis. *Ann N Y Acad Sci* 2005;1050:295-303.
- [32] Grootenboer-Mignot S, Nicaise-Roland P, Delaunay C, Meyer O, Chollet-Martin S, Labarre C. Second generation anti-cyclic citrullinated peptide (anti-CCP2) antibodies can replace other anti-filaggrin antibodies and improve rheumatoid arthritis diagnosis. *Scand J Rheumatol* 2004;33(4):218-20.
- [33] Gupta R, Thabah MM, Aneja R, Kumar A, Varghese T, Chandrasenan PJ. Usefulness of anti -CCP antibodies in rheumatic diseases in Indian patients. *Indian J Med Sci* 2009;63(3):92-100.
- [34] Havemose-Poulsen A, Westergaard J, Stoltze K, Skjodt H, Danneskiold-Samsoe B, Locht H, Bendtzen K, Holmstrup P. Periodontal and hematological characteristics associated with aggressive periodontitis, juvenile idiopathic arthritis, and rheumatoid arthritis. *J Periodontol* 2006;77(2):280-8.
- [35] Heidari B, Firouzjahi A, Heidari P, Hajian K. The prevalence and diagnostic performance of anti-cyclic citrullinated peptide antibody in rheumatoid arthritis: the predictive and discriminative ability of serum antibody level in recognizing rheumatoid arthritis. *Ann Saudi Med* 2009;29(6):467-70.
- [36] Herold M, Boeser V, Russe E, Klotz W. Anti-CCP: history and its usefulness. *Clin Dev Immunol* 2005;12(2):131-5.
- [37] Hill JA, Al-Bishri J, Gladman DD, Cairns E, Bell DA. Serum autoantibodies that bind citrullinated fibrinogen are frequently found in patients with rheumatoid arthritis. *J Rheumatol* 2006;33(11):2115-9.
- [38] Hitchon CA, Alex P, Erdile LB, Frank MB, Dozmorov I, Tang Y, Wong K, Centola M, El-Gabalawy HS. A distinct multicytokine profile is associated with anti-cyclical citrullinated peptide antibodies in patients with early untreated inflammatory arthritis. *J Rheumatol* 2004;31(12):2336-46.

- [39] Hodkinson B, Meyer PW, Musenge E, Ally MM, Wadee AA, Anderson R, Tikly M. The diagnostic utility of the anti-CCP antibody test is no better than rheumatoid factor in South Africans with early rheumatoid arthritis. *Clin Rheumatol* 2010;29(6):615-8.
- [40] Hwang SM, Kim JO, Yoo YM, Shin S, Kim JQ, Park MH, Song EY. Performance analysis of the ARCHITECT anti-cyclic citrullinated peptide antibody in the diagnosis of rheumatoid arthritis. *Clin Chem Lab Med* 2010;48(2):225-30.
- [41] Inanc N, Dalkilic E, Kamali S, Kasapoglu-Gunal E, Elbir Y, Direskeneli H, Inanc M. Anti-CCP antibodies in rheumatoid arthritis and psoriatic arthritis. *Clin Rheumatol* 2007;26(1):17-23.
- [42] Innala L, Kokkonen H, Eriksson C, Jidell E, Berglin E, Dahlqvist SR. Antibodies against mutated citrullinated vimentin are a better predictor of disease activity at 24 months in early rheumatoid arthritis than antibodies against cyclic citrullinated peptides. *J Rheumatol* 2008;35(6):1002-8.
- [43] Ioan-Facsinay A, Willemze A, Robinson DB, Peschken CA, Markland J, van der Woude D, Elias B, Menard HA, Newkirk M, Fritzler MJ, Toes RE, Huizinga TW, El-Gabalawy HS. Marked differences in fine specificity and isotype usage of the anti-citrullinated protein antibody in health and disease. *Arthritis Rheum* 2008;58(10):3000-8.
- [44] Jorgensen KT, Wiik A, Pedersen M, Hedegaard CJ, Vestergaard BF, Gislevoss RE, Kvien TK, Wohlfahrt J, Bendtzen K, Frisch M. Cytokines, autoantibodies and viral antibodies in premorbid and postdiagnostic sera from patients with rheumatoid arthritis: case-control study nested in a cohort of Norwegian blood donors. *Ann Rheum Dis* 2008;67(6):860-6.
- [45] Kastbom A, Strandberg G, Lindroos A, Skogh T. Anti-CCP antibody test predicts the disease course during 3 years in early rheumatoid arthritis (the Swedish TIRA project). *Ann Rheum Dis* 2004;63(9):1085-9.
- [46] Kim S, Kim JH, Lee JH, Kim HS. Evaluation of three automated enzyme immunoassays for detection of anti-cyclic citrullinated peptide antibodies in qualitative and quantitative aspects. *Rheumatology (Oxford)* 2010;49(3):450-7.
- [47] Koivula MK, Heliovaara M, Ramberg J, Knekt P, Rissanen H, Palosuo T, Risteli J. Autoantibodies binding to citrullinated telopeptide of type II collagen and to cyclic citrullinated peptides predict synergistically the development of seropositive rheumatoid arthritis. *Ann Rheum Dis* 2007;66(11):1450-5.

- [48] Koivula MK, Savolainen E, Kaipiainen-Seppanen O, Kautiainen H, Luosujarvi R, Hakala M, Risteli J. Sensitivity and specificity of autoantibodies binding to citrullinated carboxyterminal telopeptides of types I and II collagens in an early arthritis series. *Rheumatology (Oxford)* 2008;47(5):656-9.
- [49] Korkmaz C, Us T, Kasifoglu T, Akgun Y. Anti-cyclic citrullinated peptide (CCP) antibodies in patients with long-standing rheumatoid arthritis and their relationship with extra-articular manifestations. *Clin Biochem* 2006;39(10):961-5.
- [50] Kudo-Tanaka E, Ohshima S, Ishii M, Mima T, Matsushita M, Azuma N, Harada Y, Katada Y, Ikeue H, Umehita-Sasai M, Miyatake K, Saeki Y. Autoantibodies to cyclic citrullinated peptide 2 (CCP2) are superior to other potential diagnostic biomarkers for predicting rheumatoid arthritis in early undifferentiated arthritis. *Clin Rheumatol* 2007;26(10):1627-33.
- [51] Kwok JS, Hui KH, Lee TL, Wong W, Lau YL, Wong RW, Kim DL, Jones BM. Anti-cyclic citrullinated peptide: diagnostic and prognostic values in juvenile idiopathic arthritis and rheumatoid arthritis in a Chinese population. *Scand J Rheumatol* 2005;34(5):359-66.
- [52] Lee DM, Schur PH. Clinical utility of the anti-CCP assay in patients with rheumatic diseases. *Ann Rheum Dis* 2003;62(9):870-4.
- [53] Lim MK, Sheen DH, Lee YJ, Mun YR, Park M, Shim SC. Anti-cyclic citrullinated peptide antibodies distinguish hepatitis B virus (HBV)-associated arthropathy from concomitant rheumatoid arthritis in patients with chronic HBV infection. *J Rheumatol* 2009;36(4):712-6.
- [54] Limaye S, Carr V, Kirkpatrick P, Williams A, Adelstein S. Antibodies to cyclic citrullinated peptide in patients with chronic arthritis attending an arthritis-monitoring clinic. *J Clin Rheumatol* 2005;11(3):150-2.
- [55] Liu FC, Chao YC, Hou TY, Chen HC, Shyu RY, Hsieh TY, Chen CH, Chang DM, Lai JH. Usefulness of anti-CCP antibodies in patients with hepatitis C virus infection with or without arthritis, rheumatoid factor, or cryoglobulinemia. *Clin Rheumatol* 2008;27(4):463-7.
- [56] Liu X, Jia R, Zhao J, Li Z. The role of anti-mutated citrullinated vimentin antibodies in the diagnosis of early rheumatoid arthritis. *J Rheumatol* 2009;36(6):1136-42.
- [57] Lopez-Hoyos M, Ruiz de Alegria C, Blanco R, Crespo J, Pena M, Rodriguez-Valverde V, Martinez-Taboada VM. Clinical utility of anti-CCP antibodies in the differential diagnosis of elderly-onset rheumatoid arthritis and polymyalgia rheumatica. *Rheumatology (Oxford)* 2004;43(5):655-7.

- [58] Lopez-Longo FJ, Rodriguez-Mahou M, Sanchez-Ramon S, Estecha A, Balsera M, Plaza R, Fernandez-Cruz E, Perez LC. Anti-cyclic citrullinated peptide versus anti-Sa antibodies in diagnosis of rheumatoid arthritis in an outpatient clinic for connective tissue disease and spondyloarthritis. *J Rheumatol* 2006;33(8):1476-81.
- [59] Lutteri L, Malaise M, Chapelle JP. Comparison of second- and third-generation anti-cyclic citrullinated peptide antibodies assays for detecting rheumatoid arthritis. *Clin Chim Acta* 2007;386(1-2):76-81.
- [60] Mori S, Naito H, Ohtani S, Yamanaka T, Sugimoto M. Diagnostic utility of anti-cyclic citrullinated peptide antibodies for rheumatoid arthritis in patients with active lung tuberculosis. *Clin Rheumatol* 2009;28(3):277-83.
- [61] Mutlu N, Bicakcigil M, Tasan DA, Kaya A, Yavuz S, Ozden AI. Comparative performance analysis of 4 different anti-citrullinated protein assays in the diagnosis of rheumatoid arthritis. *J Rheumatol* 2009;36(3):491-500.
- [62] Narvaez J, Sirvent E, Narvaez JA, Bas J, Gomez-Vaquero C, Reina D, Nolla JM, Valverde J. Usefulness of magnetic resonance imaging of the hand versus anticyclic citrullinated peptide antibody testing to confirm the diagnosis of clinically suspected early rheumatoid arthritis in the absence of rheumatoid factor and radiographic erosions. *Semin Arthritis Rheum* 2008;38(2):101-9.
- [63] Nell VP, Machold KP, Stamm TA, Eberl G, Heinzl H, Uffmann M, Smolen JS, Steiner G. Autoantibody profiling as early diagnostic and prognostic tool for rheumatoid arthritis. *Ann Rheum Dis* 2005;64(12):1731-6.
- [64] Nell-Duxneuner V, Machold K, Stamm T, Eberl G, Heinzl H, Hoefler E, Smolen JS, Steiner G. Autoantibody profiling in patients with very early rheumatoid arthritis: a follow-up study. *Ann Rheum Dis* 2010;69(1):169-74.
- [65] Nielen MM, van der Horst AR, van Schaardenburg D, van der Horst-Bruinsma IE, van de Stadt RJ, Aarden L, Dijkmans BA, Hamann D. Antibodies to citrullinated human fibrinogen (ACF) have diagnostic and prognostic value in early arthritis. *Ann Rheum Dis* 2005;64(8):1199-204.
- [66] Nikolaisen C, Rekvig OP, Nossent HC. Diagnostic impact of contemporary biomarker assays for rheumatoid arthritis. *Scand J Rheumatol* 2007;36(2):97-100.
- [67] Panchagnula R, Rajiv SR, Prakash J, Chandrashekara S, Suresh KP. Role of anticyclic citrullinated peptide in the diagnosis of early rheumatoid factor-negative suspected rheumatoid arthritis: is it worthwhile to order the test? *J Clin Rheumatol* 2006;12(4):172-5.

- [68] Predeteanu D, Varzaru L, Balanescu A, Bojinca V, Opris D, Vlad V, Berghea F, Abobului M, Constantinescu C, Ionescu R. Anti-cyclic citrullinated peptide antibodies--activity markers in rheumatoid arthritis. *J Med Life* 2009;2(1):36-41.
- [69] Qing YF, Zhang QB, Zhou JG, Yuan GH, Wei J, Xing Y, Liu JP, Jiang L, Chen JP. The detecting and clinical value of anti-cyclic citrullinated peptide antibodies in patients with systemic lupus erythematosus. *Lupus* 2009;18(8):713-7.
- [70] Quinn MA, Gough AK, Green MJ, Devlin J, Hensor EM, Greenstein A, Fraser A, Emery P. Anti-CCP antibodies measured at disease onset help identify seronegative rheumatoid arthritis and predict radiological and functional outcome. *Rheumatology (Oxford)* 2006;45(4):478-80.
- [71] Rantapaa-Dahlqvist S, de Jong BA, Berglin E, Hallmans G, Wadell G, Stenlund H, Sundin U, van Venrooij WJ. Antibodies against cyclic citrullinated peptide and IgA rheumatoid factor predict the development of rheumatoid arthritis. *Arthritis Rheum* 2003;48(10):2741-9.
- [72] Raza K, Breese M, Nightingale P, Kumar K, Potter T, Carruthers DM, Situnayake D, Gordon C, Buckley CD, Salmon M, Kitas GD. Predictive value of antibodies to cyclic citrullinated peptide in patients with very early inflammatory arthritis. *J Rheumatol* 2005;32(2):231-8.
- [73] Ribeiro SL, Pereira HL, Silva NP, Neves RM, Sato EI. Anti-cyclic citrullinated peptide antibodies and rheumatoid factor in leprosy patients with articular involvement. *Braz J Med Biol Res* 2008;41(11):1005-10.
- [74] Rodriguez-Mahou M, Lopez-Longo FJ, Sanchez-Ramon S, Estecha A, Garcia-Segovia A, Rodriguez-Molina JJ, Carreno L, Fernandez-Cruz E. Association of anti-cyclic citrullinated peptide and anti-Sa/citrullinated vimentin autoantibodies in rheumatoid arthritis. *Arthritis Rheum* 2006;55(4):657-61.
- [75] Ryu HJ, Takeuchi F, Kuwata S, Kim YJ, Lee EY, Lee EB, Song YW. The diagnostic utilities of anti-agalactosyl IgG antibodies, anti-cyclic citrullinated peptide antibodies, and rheumatoid factors in rheumatoid arthritis. *Rheumatol Int* 2009.
- [76] Salvador G, Gomez A, Vinas O, Ercilla G, Canete JD, Munoz-Gomez J, Sanmarti R. Prevalence and clinical significance of anti-cyclic citrullinated peptide and antikeratin antibodies in palindromic rheumatism. An abortive form of rheumatoid arthritis? *Rheumatology (Oxford)* 2003;42(8):972-5.
- [77] Samanci N, Ozdem S, Akbas H, Mutlu D, Gultekin M, Arman M, Donmez L. Diagnostic value and clinical significance of anti-CCP in patients with advanced rheumatoid arthritis. *J Natl Med Assoc* 2005;97(8):1120-6.

- [78] Santiago M, Baron M, Miyachi K, Fritzler MJ, Abu-Hakima M, Leclercq S, Bell M, Hudson M, Mathieu JP, Taillefer S, Jones N, Docherty P, Khraishi M, Markland J, Pope J, Robinson D, Smith D, Sutton E. A comparison of the frequency of antibodies to cyclic citrullinated peptides using a third generation anti-CCP assay (CCP3) in systemic sclerosis, primary biliary cirrhosis and rheumatoid arthritis. *Clin Rheumatol* 2008;27(1):77-83.
- [79] Sauerland U, Becker H, Seidel M, Schotte H, Willeke P, Schorat A, Schluter B, Domschke W, Gaubitz M. Clinical utility of the anti-CCP assay: experiences with 700 patients. *Ann N Y Acad Sci* 2005;1050:314-8.
- [80] Sene D, Ghillani-Dalbin P, Limal N, Thibault V, van Boekel T, Piette JC, Cacoub P. Anti-cyclic citrullinated peptide antibodies in hepatitis C virus associated rheumatological manifestations and Sjogren's syndrome. *Ann Rheum Dis* 2006;65(3):394-7.
- [81] Sghiri R, Bouagina E, Zaglaoui H, Mestiri H, Harzallah L, Harrabi I, Ghannouchi M, Mokhtar F, Ghedira I. Diagnostic performances of anti-cyclic citrullinated peptide antibodies in rheumatoid arthritis. *Rheumatol Int* 2007;27(12):1125-30.
- [82] Sghiri R, Bouajina E, Bargaoui D, Harzallah L, Fredj HB, Sammoud S, Ghedira I. Value of anti-mutated citrullinated vimentin antibodies in diagnosing rheumatoid arthritis. *Rheumatol Int* 2008;29(1):59-62.
- [83] Shibata S, Tada Y, Komine M, Hattori N, Osame S, Kanda N, Watanabe S, Saeki H, Tamaki K. Anti-cyclic citrullinated peptide antibodies and IL-23p19 in psoriatic arthritis. *J Dermatol Sci* 2009;53(1):34-9.
- [84] Shidara K, Inoue E, Tanaka E, Hoshi D, Seto Y, Nakajima A, Momohara S, Taniguchi A, Yamanaka H. Comparison of the second and third generation anti-cyclic citrullinated peptide antibody assays in the diagnosis of Japanese patients with rheumatoid arthritis. *Rheumatol Int* 2010.
- [85] Silveira IG, Burlingame RW, von Muhlen CA, Bender AL, Staub HL. Anti-CCP antibodies have more diagnostic impact than rheumatoid factor (RF) in a population tested for RF. *Clin Rheumatol* 2007;26(11):1883-9.
- [86] Singh U, Vishwanath A, Verma PK, Singh NK, Shukla RC, Singh S, Sonkar GK. Is rheumatoid factor still a superior test for the diagnosis of rheumatoid arthritis? *Rheumatol Int* 2010.
- [87] Singwe-Ngandeu M, Finckh A, Bas S, Tiercy JM, Gabay C. Diagnostic value of anti-cyclic citrullinated peptides and association with HLA-DRB1 shared epitope alleles in African rheumatoid arthritis patients. *Arthritis Res Ther* 2010;12(2):R36.

- [88] Snijders GF, Broeder AA, Bevers K, Jeurissen ME, van Eerd JE, van den Hoogen FH. Measurement characteristics of a new rapid anti-CCP2 test compared to the anti-CCP2 ELISA. *Scand J Rheumatol* 2008;37(2):151-4.
- [89] Soderlin MK, Kastbom A, Kautiainen H, Leirisalo-Repo M, Strandberg G, Skogh T. Antibodies against cyclic citrullinated peptide (CCP) and levels of cartilage oligomeric matrix protein (COMP) in very early arthritis: relation to diagnosis and disease activity. *Scand J Rheumatol* 2004;33(3):185-8.
- [90] Soos L, Szekanecz Z, Szabo Z, Fekete A, Zeher M, Horvath IF, Danko K, Kapitany A, Vegvari A, Sipka S, Szegedi G, Lakos G. Clinical evaluation of anti-mutated citrullinated vimentin by ELISA in rheumatoid arthritis. *J Rheumatol* 2007;34(8):1658-63.
- [91] Suzuki K, Sawada T, Murakami A, Matsui T, Tohma S, Nakazono K, Takemura M, Takasaki Y, Mimori T, Yamamoto K. High diagnostic performance of ELISA detection of antibodies to citrullinated antigens in rheumatoid arthritis. *Scand J Rheumatol* 2003;32(4):197-204.
- [92] Takasaki Y, Yamanaka K, Takasaki C, Matsushita M, Yamada H, Nawata M, Matsudaira R, Ikeda K, Kaneda K, Hashimoto H. Anticyclic citrullinated peptide antibodies in patients with mixed connective tissue disease. *Mod Rheumatol* 2004;14(5):367-75.
- [93] Tamai M, Kawakami A, Uetani M, Takao S, Arima K, Iwamoto N, Fujikawa K, Aramaki T, Kawashiri SY, Ichinose K, Kamachi M, Nakamura H, Origuchi T, Ida H, Aoyagi K, Eguchi K. A prediction rule for disease outcome in patients with undifferentiated arthritis using magnetic resonance imaging of the wrists and finger joints and serologic autoantibodies. *Arthritis Rheum* 2009;61(6):772-8.
- [94] Tampioia M, Brescia V, Fontana A, Maggiolini P, Lapadula G, Pansini N. Anti-cyclic citrullinated peptide autoantibodies measured by an automated enzyme immunoassay: analytical performance and clinical correlations. *Clin Chim Acta* 2005;355(1-2):137-44.
- [95] Tanaka R, Takemura M, Sato M, Yamada Y, Nakagawa T, Horibe T, Hoshi M, Otaki H, Ito H, Seishima M, Shimizu K. Comparison of chemiluminescence enzyme immunoassay (CLEIA) with ELISA for the determination of anti-cyclic citrullinated peptide antibodies. *Clin Chim Acta* 2010;411(1-2):22-5.
- [96] Vallbracht I, Rieber J, Oppermann M, Forger F, Siebert U, Helmke K. Diagnostic and clinical value of anti-cyclic citrullinated peptide antibodies compared with

- rheumatoid factor isotypes in rheumatoid arthritis. *Ann Rheum Dis* 2004;63(9):1079-84.
- [97] Vander Cruyssen B, Nogueira L, Van Praet J, Deforce D, Elewaut D, Serre G, De Keyser F. Do all anti-citrullinated protein/peptide antibody tests measure the same? Evaluation of discrepancy between anti-citrullinated protein/peptide antibody tests in patients with and without rheumatoid arthritis. *Ann Rheum Dis* 2008;67(4):542-6.
- [98] Vanichapuntu M, Phuekfon P, Suwannalai P, Verasertniyom O, Nantiruj K, Janwityanujit S. Are anti-citrulline autoantibodies better serum markers for rheumatoid arthritis than rheumatoid factor in Thai population? *Rheumatol Int* 2010;30(6):755-9.
- [99] Vittecoq O, Incaurgarat B, Jouen-Beades F, Legoedec J, Letourneur O, Rolland D, Gervasi G, Menard JF, Gayet A, Fardellone P, Daragon A, Jolivet M, le Loet X, Tron F. Autoantibodies recognizing citrullinated rat filaggrin in an ELISA using citrullinated and non-citrullinated recombinant proteins as antigens are highly diagnostic for rheumatoid arthritis. *Clin Exp Immunol* 2004;135(1):173-80.
- [100] Wagner E, Skoumal M, Bayer PM, Klaushofer K. Antibody against mutated citrullinated vimentin: a new sensitive marker in the diagnosis of rheumatoid arthritis. *Rheumatol Int* 2009;29(11):1315-21.
- [101] Wild N, Karl J, Grunert VP, Schmitt RI, Garczarek U, Krause F, Hasler F, van Riel PL, Bayer PM, Thun M, Mattey DL, Sharif M, Zolg W. Diagnosis of rheumatoid arthritis: multivariate analysis of biomarkers. *Biomarkers* 2008;13(1):88-105.
- [102] Wu R, Shovman O, Zhang Y, Gilburd B, Zandman-Goddard G, Shoenfeld Y. Increased prevalence of anti-third generation cyclic citrullinated peptide antibodies in patients with rheumatoid arthritis and CREST syndrome. *Clin Rev Allergy Immunol* 2007;32(1):47-56.
- [103] Yamane T, Hashiramoto A, Tanaka Y, Tsumiyama K, Miura Y, Shiozawa K, Chihara K, Shiozawa S. Easy and accurate diagnosis of rheumatoid arthritis using anti-cyclic citrullinated peptide 2 antibody, swollen joint count, and C-reactive protein/rheumatoid factor. *J Rheumatol* 2008;35(3):414-20.