

Main prognostic studies about Early Repolarization on electrocardiogram

Compilation by Dr. Andrés R. Pérez Riera

Author **Tikkannen Jani T Tikkannen 1, Olli Anttonen, M Juhani Junttila, Aapo L Aro, Tuomas Kerola, Harri A Rissanen, Antti Reunanen, Heikki V Huikuri** Long-term outcome associated with early repolarization on electrocardiography **N Engl J Med. 2009 Dec 24;361(26):2529-37. doi: 10.1056/NEJMoa0907589**. Year: 2009; Journal: N Engl J Med, Population size:10.864; Female: 48%; Race 100 Caucasian; Mean age: 44±8 (SD); Country: Finland; Design: Prospective: community based. Conclusions: An ECG with ERP in the inferior leads of a ECG is associated with an increased risk of death from cardiac causes in middle-aged subjects. Additionally, with J-point elevation ≥ 0.2 mV in inferior leads had a markedly elevated risk of death from cardiac causes

Author: **Sinner MF, Reinhard W, Müller M, et al. Association of early repolarization pattern on ECG with risk of cardiac and all-cause mortality: a population-based prospective cohort study (MONICA/KORA) PLoS Med. 2010 Jul; 7(7): e1000314. Published online 2010 Jul 27. doi: 10.1371/journal.pmed.1000314** Year: 2010; Journal: PLOS; Population size:1945; Female: 51%; Race: All Caucasian; Mean age: 35-54 middle-aged individuals (SD); Country: Germany; Design: A Population-Based Prospective Cohort Study (MONICA/KORA); Conclusions: They found a high prevalence of ERP in this population-based cohort of middle-aged individuals. ERP was associated with about a 2- to 4-fold increased risk of cardiac mortality. An inferior localization of ERP was associated with a particularly increased risk.

Authors **Uberoi, Abhimanyu Uberoi 1, Nikhil A Jain, Marco Perez, Anthony Weinkopff, Euan Ashley, David Hadley, Mintu P Turakhia, Victor Froelicher.** Early repolarization in an ambulatory clinical

population. Circulation. 2011 Nov 15;124(20):2208-14. doi:10.1161/CIRCULATIONAHA.111.047191. Year: 2011; Journal: Circulation; Population size: 29.281 resting ambulatory ECGs from the VA Palo Alto Health Care System with ERP criteria; Female: 13%; African descent: 13%; Mean age 55 ±145 (SD); Country USA: Design: Prospective study; Conclusions: they found no significant association between any components of ERP and cardiac mortality.

Authors **Daisuke Haruta 1, Kiyotaka Matsuo, Akira Tsuneto, Shinichiro Ichimaru, Ayumi Hida, Nobuko Sera, Misa Imaizumi, Eiji Nakashima, Koji Maemura, Masazumi Akahoshi.** **Incidence and prognostic value of early repolarization pattern in the 12-lead electrocardiogram. Circulation. 2011 Jun 28;123(25):2931-7. doi: 10.1161/CIRCULATIONAHA.110.006460.** Year: 2011; Journal; Circulation Population size:5976; Female: 56%; African descent: 0%. All Asians; Mean age: 45 y (SD); Country: Japan; Design: reviewed all the ECGs records of the 5976 atomic-bomb survivors who were examined at least once during our biennial health examination in Nagasaki, Japan, between July 1958 and December 2004.; Conclusions: ERP is associated with an elevated risk of unexpected death and a decreased risk of cardiac and all-cause death. Specific ERP morphologies and location are associated with an adverse prognosis.

Authors **Kristoff A Olson 1, Anthony J Viera, Elsayed Z Soliman, Richard S Crow, Wayne D Rosamond.** **Long-term prognosis associated with J-point elevation in a large middle-aged biracial cohort: the ARIC study. Eur Heart J. 2011 Dec;32(24):3098-106. doi: 10.1093/eurheartj/ehr264.** Year:2011; Journal Eur Heart J; Population size:15.141; Female:56%; African descent 27%); Mean age 54±6 (SD) Country: USA; Design: prospective, population-based Atherosclerosis Risk in Communities (ARIC) study; Conclusion: Their results suggest that J point elevation is associated with an increased risk of SCD in whites and in females, but not in blacks or males. Further studies are needed to clarify which subgroups of individuals with J-Point elevations are at increased risk for adverse cardiac events.

Authors **Stavrakis S, Patel N, Te C, Golwala H, George A, Lozano P, Lazzara R.** **Development and validation of a prognostic index for risk stratification of patients with early repolarization. Ann Noninvasive Electrocardiol. 2012 Oct;17(4):361-71. doi: 10.1111/j.1542-474X.**

2012.00533.x. Year: 2012; Journal: Ann Noninvasive Electrocardiol. Population size: 825 ERP with 253 controls; Female:1 ; African descent (%); Mean age 49 ± 12 years (SD) Country: USA; Design: Conclusions: A prognosis index derived from simple clinical and ECG characteristics predicts mortality in patients with ERP and may be used clinically for risk stratification.

Authors Rollin et al (**Rollin A, Maury P, Bongard V, Sacher F, Delay M, Duparc A, Mondoly P, Carrié D, Ferrières J, Ruidavets JB. Prevalence, prognosis, and identification of the malignant form of early repolarization pattern in a population-based study. Am J Cardiol. 2012 Nov 1;110(9):1302-8. doi: 10.1016/j.amjcard.2012.06.033.**) Year:2012; Journal: Am J Cardiol.; Population size:1161 African descent 0%; Female:48%; Mean age 50 ± 9 (SD); Country: France; Design: Prospective (MONICA); Conclusions: ERP with notching pattern and horizontal/descendant ST segments was associated with the highest risk of all-cause and cardiovascular deaths. These ECG patterns may be used for risk stratification in subjects with ERP.

Authors Hisamatsu T et al (**Takashi Hisamatsu 1, Takayoshi Ohkubo, Katsuyuki Miura, Takashi Yamamoto, Akira Fujiyoshi, Naoko Miyagawa, Aya Kadota, Naoyuki Takashima, Shin-ya Nagasawa, Yoshikuni Kita, Yoshitaka Murakami, Akira Okayama, Minoru Horie, Tomonori Okamura, Hirotsugu Ueshima, NIPPON DATA90 Research Group Association between J-point elevation and death from coronary artery disease--15-year follow up of the NIPPON DATA90. Circ J. 2013;77(5):1260-6. doi: 10.1253/circj. cj-12-1273.** Year: 2013; Journal; Population size: 7639; Female:59%; African descent 0%; Mean age: 52 ± 4 (SD); Country: Japan; Design; prospective study in a representative general Japanese population of 7,630 individuals; Conclusions: J-point elevation on standard 12-lead ECG was an independent predictor of cardiac death and death from CAD in a representative sample of the general Japanese population, particularly among the middle-aged.

Authors Ota Ch et al. (**Chiho Ota 1, Sin-nosuke Shiono 1, Yuji Fujino 1, Takahiko Kamibayashi 1, Yukio Hayashi 2 Prevalence and Prognostic Value of Early Repolarization in Low Risk Surgical Patients. Biomed Res Int. 2015; 2015:309260. doi: 10.1155/2015/309260.**); Year: 2015; Journal Biomed Res Int.; Population size: 2809 patients (219 with ERP) over 18 years of age and with ASA class I and II risk low risk surgical

patients and without SHD: Female 30 %: African descent: 0%, All Asians; Mean age: 53.6 ± 18.1 (SD); Country: Japan; Design: retrospective study with one year follow up after surgery. Conclusion; presence of ERP before anesthesia is a marker of increased risk of newly observed cardiac events one year after surgery in low risk surgical patients.