J Wave on the electrocardiogram (ECG) has been traditionally regarded as a marker of “good health” and is in fact more prevalent in the young and in healthy athletes. However, the prognostic significance of the J wave with/without ST-segment elevation has recently become controversial. Although a meta-analysis of prospective studies suggested that the early repolarization pattern is associated with increased risk for arrhythmia death, the absolute incidence rate was low to intermediate (70 cases per 100,000 person-years for arrhythmia death). Those results shift our approach to distinguishing “malignant” J waves from “benign” J waves through detailed analysis of clinical characteristics (eg, male sex, history of familial sudden death) and ECG features (eg, J wave amplitude, J wave distribution, pattern of early repolarization). Obviously, focusing on syncope, a common clinical characteristic, has become a relevant issue. A crucial step for putting the J wave of syncope subjects in the right clinical perspective is to establish their actual prevalence and their relations. The study by Chiba et al in this issue of the Journal provides an insight to the issue.

J Waves in the General Population and Syncope

The prevalence of the J wave in the general population reportedly ranges from 1.0% to 24.8% (Table). The variation in estimates can be caused by differences in trait definition, population age, and study sample demographics. On the other hand, in the limited evidence of the prevalence in the syncope population, the prevalence of the J wave among syncope subjects is remarkably high in comparison with other studies of the general population (Table). Chiba et al report that 37% of patients with syncope had a J wave. This is high compared with the 3.5% in the general Japanese population. Although the prevalence is comparable to that reported in a previous study from Poland (31%), in the Framingham Heart Study it was only 61.1% and another recent report showed about half that among syncope subjects. The J wave may show circadian changes and be present intermittently. Further research is needed under an agreed definition and standardized measurements.

J Waves and Reflex Syncope

Reflex (neurally mediated) syncpe is the most frequent cause of syncpe in any setting. Patients in whom structural or electrical heart disease has been excluded and are affected by reflex syncpe have an excellent prognosis. Many poor outcomes seem to be related to the severity of the “underlying condition” rather than to syncpe per se. Recent studies suggest that the J wave is a marker of increased dispersion of repolarization, suggesting the J wave could be an “underlying condition” in subjects with syncope. Considering early repolarization syndrome and Brugada syndrome can be a common clinical entity under the term of J-wave syndromes, the association between the J wave and reflex syncpe has now become even more important.

Chiba et al show that a J-wave pattern in the inferior or lateral leads was associated with reflex syncpe. However, Löbe et al reported a completely different result that J waves in the inferior leads are less frequently found in subjects with vasovagal syncpe than in those with unexplained syncpe. To date, J waves in the inferolateral leads can be an important diagnostic sign of a high-risk person with a history of syncpe. Until we have further evidence from syncpe subjects, we are left with the observation that in subjects with J waves in the inferolateral leads and any type of syncpe, arrhythmic events may occur.

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**Table. J Wave/Early Repolarization Pattern in the General Population as Recently Published**

| Study* | n   | Age (years) | Men   | Race or population                                      | Definition                                                                 | Prevalence |
|--------|-----|-------------|-------|--------------------------------------------------------|---------------------------------------------------------------------------|------------|
| Mansi, 2001 | 597 | 15–60       | 58.5% | 58.6% Saudi Arabian, 6.5% Filipino, 15.9% Indian, 2.8% Sri Lankan, and 9.5% Caucasian | ST segment elevation with upward concavity, notching on QRS, and large symmetrical T wave | 3.5%       |
| Klatsky, 2003 | 73,088 | Adults | 43.8% | 55% White, 31% Black, 10% Asian, 4% Hispanic           | J point amplitude of ≥0.05 mV for ≥0.03 s in inferior or right/left precordial leads | 0.9%       |
| Kui, 2007 | 1,817 | 18–91      | 62.2% | Chinese                                                 | J point amplitude of ≥0.1 mV in ≥2 adjacent leads with slurring or notching morphology | 7.3%       |
| Tikkanen, 2009 | 10,864 | Adults | 52.4% | Finnish                                                 | J point amplitude of ≥0.1 mV in ≥2 leads in the inferior or lateral territory, or both | 5.8%       |
| Sinner, 2010 (MONICA/KORA) | 6,213 | 35–74      | 48.9% | German                                                  | J point amplitude of ≥0.1 mV in any lead                                      | 13.1%      |
| Nosek, 2011 (FHS, H2K) | 3,995 | 18–80      | 46.1% | From Framingham Heart Study                             | J point amplitude of ≥0.1 mV in ≥2 leads with slurring or notching morphology | 6.1%       |
| Olson, 2011 (ARIC study) | 5,489 | 18–80      | 44.2% | Finnish                                                 | J point amplitude of ≥0.1 mV in ≥2 leads in the inferior or lateral territory, or both | 3.3%       |
| Reinhard, 2011 | 5,839 | 18–60      | 50.2% | British from GRAPHIC study                              | J point amplitude of ≥0.1 mV in at least 2 adjacent leads in inferior or anterolateral leads | 7.7%       |
| Perez, 2012 | 29,281 (mean age of 55) | 87.2% | 13.3% African-American, 88.7% non-African American | J point amplitude of ≥0.1 mV in ≥2 leads in the inferior or lateral territory, or both | 23.3%      |
| Rollin, 2012 | 1,161 | 35–64      | 51.6% | Subjects living in southwestern France                  | J point amplitude of ≥0.1 mV in ≥2 leads in the inferior or lateral territory, or both | 13.7%      |
| Hisamatsu, 2013 (NIPPON DATA80) | 4,348 | 30–95      | 100%  | Japanese                                                | J point amplitude of ≥0.1 mV in the inferior and lateral leads, V5 lead; ≥0.2 mV in V1–V4 | 7.8%       |
| Hisamatsu, 2013 (NIPPON DATA90) | 7,630 | 30–95      | 40.7% | Japanese                                                | J point amplitude of ≥0.1 mV                                             | 3.5%       |
| Aagaard, 2014 | 211,920 | 18–75     | 52%   | African American, non-Hispanic White, Hispanic         | Software determined early repolarization                                             | 1.5%       |
| Ilkahannoff, 2014 (CARDIA study) | 5,039 | 25 (year 0) | 54.5% | 48.4% White, 51.6% Black                               | J point amplitude of ≥0.1 mV in ≥2 leads in the inferior or lateral territory; ≥0.1 mm ST elevation in the inferior and/or lateral leads | 2.3%       |
| Ilkahannoff, 2014 (CARDIA study) | 3,653 | 32 (year 7) | 54.2% | 45.8% White, 54.2% Black                               | J point amplitude of ≥0.1 mV in ≥2 leads in the inferior or lateral territory; ≥0.1 mm ST elevation in the inferior and/or lateral leads | 13.7%      |
| Ilkahannoff, 2014 (CARDIA study) | 2,491 | 45 (year 20) | 56.8% | 55.5% White, 44.5% Black                               | J point amplitude of ≥0.1 mV in ≥2 contiguous inferior or lateral leads        | 6.6%       |
| Shulman, 2015 | 33,944 | >18        | 36.3% | Hispanic                                                | J point amplitude of ≥0.1 mV in any 2 contiguous inferior or lateral leads      | 1.6%       |

*PMID: Mansi, 11698997; Klatsky, 12935822; Kui, 18164970; Tikkanen, 19117913; Sinner, 20668657; Noseworthy, 21600720; Olson, 21785106; Reinhard, 21282333; Perez, 22094072; Rollin, 22819431; Hisamatsu, 2366393 and 23358431; Aagaard, 25360428; Ilkahannoff, 24759868; Shulman, 2620160.*