**Objective:** We investigated the relation between ventricular morphology and function and J-wave. **Methods:** We reviewed twelve-leads ECG of consecutive 147 patients who underwent cardiac MRI. The morphological abnormality of ventricle was evaluated by the longest diameter in RV and LV (d-RVmax/d-LV max) and the area (a-RVmax/a-LV max), and the ratio of RV/LVmax by cardiac MRI. And the functional abnormality was evaluated by the contraction percentage of the area of RV (CP-RV). **Results:** Sixty-nine patients (47.2%) had J-waves defined as the QRS-ST junction elevation > 0.1mV from baseline in the inferior/lateral lead (J-group; 58 ± 16 years, 46 men). Seventy-seven patients (52.8%) did not (NJ-group; 59 ± 16 years, 54 men). The d-RVmax and a-RVmax in J-group was longer than in NJ-group (44 ± 7.4 vs. 40 ± 7.8 mm, p = 0.001, 23 ± 6.4 vs. 21 ± 6.7 cm², p = 0.022). RV/LVmax in J-group is higher than in NJ-group (0.85 ± 0.23 vs. 0.73 ± 0.18, p < 0.001). The CP-RV in J-group was lower than in NJ-group (0.27 ± 0.13 vs. 0.34 ± 0.16, p = 0.014). The amplitude of J-waves was positively related to d-RVmax (p=0.004) and a-RVmax (p=0.012). **Conclusions:** The presence of J-wave is associated with the morphological and functional abnormality of RV. **Keywords:** J wave, abnormality of RV, cardiac MRI