Introduction Hypertrophic cardiomyopathy (HCM) has been well characterised as a condition of unexplained left ventricular hypertrophy. The phenotypic variability and inhomogeneous nature of the condition have resulted in difficulties with diagnosis and management. Despite the significant progression in cardiac imaging and genetics, the electrocardiogram (ECG) remains the cornerstone of initial evaluation, especially in asymptomatic individuals. The ECG is also widely used in pre-participation sports screening. Purpose Both early and contemporary studies concluded that the ECG is normal in just 6–10% of patients with echocardiographic evidence of HCM. This was formalised in the ESC 2014 HCM guidelines. This study sought to reassess the prevalence of a normal ECG in a HCM cohort, hypothesizing that it was much higher than previously described.

Methods 112 patients with were randomly selected from the database of a specialist cardiomyopathy clinic. Their most recent ECG, clinical and imaging data were reviewed. All patients were carriers of pathogenic sarcomere gene mutations. Patients with phenocopies or metabolic conditions were excluded. ECG data for 100 age and sex matched controls were also analysed. ECG interpretation was performed using established international criteria.

Results 18% of patients with a clinical diagnosis of HCM by conventional diagnostic standards (LV wall thickness >15mm) had a normal ECG. A further 7% had a normal ECG with a mild HCM phenotype (LV wall thickness of 13–14mm). All were sarcomere gene mutation carriers. The most common abnormality observed was T wave inversion (TWI) in 28%. A recurrent finding in the HCM group was isolated TWI in lead aVL. This occurred in 27% of patients in the absence of any other repolarisation abnormalities, compared with 1% of controls. The significance of this finding is unclear. 27% of HCM patients displayed voltage criteria for left ventricular hypertrophy by either Cornell or Sokolow-Lyon criteria, with just 4% meeting criteria for both. 13% of HCM patients had corrected QT prolongation, in the absence of medications responsible for this.

Conclusion The ECG continues to play a pivotal role in HCM diagnosis but its sensitivity to detect disease has been over-estimated. Approximately 18% of patients with clinically evident HCM will have a normal ECG, along with a further 7% of patients with mild disease expression. The limitations of its use as a screening tool must be appreciated by all clinicians and a high degree of suspicion should remain in the setting of familial disease.