HV interval cutoff should be different in women and men with syncope and bundle branch block

J. Francisco Pascual¹; J. M. Medina Maguina¹; A. Santos Ortega¹; J. Perez Rodon¹; R. Adelino¹; E. Seder¹; B. Benito¹; P. Jordan¹; N. Lal-Trehan Estrada¹; N. Mallofre¹; I. Ferreira Gonzalez²; N. Rivas Gandara¹

¹University Hospital Vall d’Hebron, Barcelona, Spain

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**Background:** Determining the optimal HV interval cutoff for predicting the need for pacemaker (PM) implantation has been a recent focus of research. Current ESC guidelines recommend HV > 70 msec based on initial studies; however, new data suggest that a cutoff of >60 msec could appropriately identify patients at high risk for requiring PM implantation. While previous studies have indicated that women with bundle branch block (BBB) have a lower risk of AV block (AVB), gender differences in the optimal cutoff for considering a positive EPS have not been thoroughly investigated.

**Methods:** This cohort study included consecutive patients with unexplained syncope and BBB, enrolled from January 2010 to October 2021, with a median follow-up time of 3 years. Patients underwent a stepwise workup protocol involving an electrophysiological study (EPS) and long-term follow-up with an implantable cardiac monitor (ICM).

**Results:** Of the 503 patients in the study, 185 (38%) were women. The median age was 78 years (IQR 71-83), the median LVEF was 58% (IQR 50-62), and 110 (22%) had ischemic heart disease. The ECG showed LBBB in 194 (39%) patients and RBBB in 287 (57%). Among these, 177 (35%) also had left anterior hemiblock. The median HV interval was 60 msec (IQR 52-73), and EPS was diagnostic in 252 (50%) patients, with the majority (221, 44%) for AVB. In 91 patients with initially negative EPS, a diagnosis was made during follow-up with an ICM, and in 35, AVB was documented. In patients with negative EPS, an HV interval >60 msec was associated with an increased risk of AVB during follow-up (HR 2.5, 95% CI 1.6-4). However, significant gender differences were found. The risk of AVB was 2.5 times higher in men (95% CI 1-6) (Figure 1). Furthermore, sensitivity, specificity, PPV, and NPV for the cutoff of 60 msec were 47%/84%/51%/82% in men and 21%/78%/21%/78% in women. The AUC to predict AVB was 0.72 (95% CI 0.6-0.8) in men and 0.51 (95% CI 0.4-0.6) in women (Figure 2).

**Conclusions:** In patients with initially negative EPS, an HV interval >60 msec was associated with a higher risk of AVB during follow-up; however, significant gender differences were observed in diagnostic accuracy. In women, a cutoff of HV interval >60 msec presented poor diagnostic accuracy compared to men. Moreover, the HV interval did not adequately predict the development of AVB in women with a basal HV interval <70 msec, suggesting it may not be suitable for considering PM implantation in female patients.

**FIGURE 1**

Kaplan–Meier survival estimates

- Male HV<60
- Female HV<60
- Male HV>60
- Female HV>60

**Months of follow-up**

0 10 20 30 40
FIGURE 2

Area under ROC curve = 0.7213

Area under ROC curve = 0.5168