

Emergency Department Prediction of Heart Failure by Bedside Physical Examination

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OBJECTIVES

A variety of presenting symptoms and features of the bedside examination are all commonly used in the diagnosis and assessment of heart failure (HF) patients. We sought to determine the relative performance of presenting symptoms and features of the physical examination, including jugular venous distention (JVD), orthopnea, and computerized detection of abnormal heart sounds, in the emergency department (ED) for the diagnosis of heart failure.

METHODS

Upon presentation to the ED, and before treatment, patients with signs of heart failure had standardized reporting of symptoms and bedside examination (JVD, dyspnea, peripheral edema, proxysmal nocturnal dyspnea, orthopnea), including a standard 12-lead ECG with acoustic signal recording for computerized detection of S3 using the validated AUDICOR[®] algorithm (Inovise Medical, Inc.). Primary diagnosis of HF was based on hospital discharge diagnosis or ED diagnosis (if the patient was not admitted). Data were analyzed using logistic regression analysis. Wald values and p-values are reported.



Figure 1 The Audicor add-on device (white) attached to an existing ECG.

RESULTS

Of the 138 patients enrolled, 113 received full bedside examination and definitive diagnosis, 46 had a primary diagnosis of HF, and 67 had a non-HF diagnosis. Within the study population there were 58.7% males in the HF group vs. 44.8% males in the non-HF group, 67.4% African-Americans in the HF group vs. 49.3% in the non-HF group, and the median age category was 66-70 years in the HF group vs. 56-60 years in the non-HF group. Using binary logistic regression, history and physical examination predictors of HF were determined (Table 1).

Table 1 Predictors of primary HF (R²=0.396)

Predictor	R ²	p
S3 Heart Sound	11.599	0.001
Peripheral Edema	9.784	0.002
Dyspnea	3.001	0.083
Orthopnea	2.857	0.091
JVD	0.981	0.322
Proxysmal Nocturnal Dyspnea	0.208	0.648

CONCLUSIONS

The third heart sound detected by the computerized AUDICOR[®] algorithm and the presence of peripheral edema were the best bedside predictors of a primary HF diagnosis.



Figure 2 Placement of the Audicor sensors

