

Prevalence of S3 and S4 in ED Patients with Decompensated Heart Failure

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BACKGROUND

The presence of abnormal diastolic heart sounds (S3 and S4) is indicative of elevated ventricular filling pressures and suggests decompensated heart failure. We sought to determine the prevalence of abnormal diastolic heart sounds in ED patients presenting with signs/symptoms of decompensated heart failure. We hypothesized an S3 and S4 would be observed more often in heart failure patients than in patients without heart failure.

METHODS

The study was a prospective, convenience sample of ED patients who had signs/symptoms of decompensated heart failure. Baseline demographic, clinical and laboratory data were collected. The presence of an S3/S4 was determined using the AUDICOR™ system (Inovise Medical, Inc.), a validated device that algorithmically detects S3 and S4 heart sounds. A diagnosis of decompensated heart failure was based on attending physician discharge summary. The prevalence of an S3 or S4 was determined in patients with a primary diagnosis of decompensated heart failure (Primary HF), a secondary diagnosis of heart failure (Secondary HF), and a non-heart failure diagnosis (No HF). Data are described with 95% confidence intervals for proportions.



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

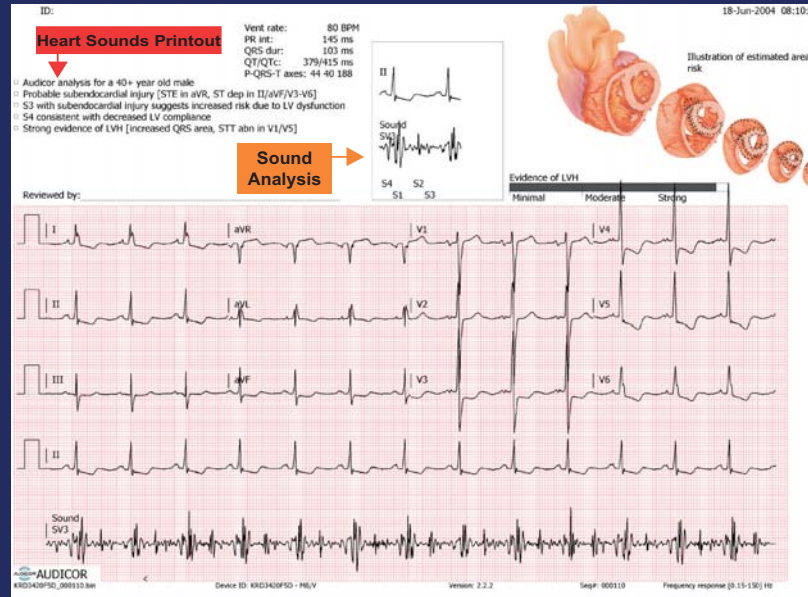


Table 1 Prevalence of S3 and S4 in all subjects.

	All (N=135)	Primary HF (N=46)	Secondary HF (N=21)	No HF (N=68)
	N (%)	N (%)	N (%)	N (%)
Heart Sounds: S3 (prevalence)	34 (25.2)	19 (41.3)	6 (28.6)	9 (13.2)
95% CI	18.6 - 33.1	28.3-55.7	13.8-50.0	7.1-23.3
Heart Sounds: S4 (prevalence)	16 (11.9)	8 (17.4)	4 (19.0)	4 (5.9)
95% CI	7.4-18.4	9.1-30.7	7.7-40.0	2.3-14.2

RESULTS

There were 135 patients enrolled, 49.6% were male and 56.3% were black. The prevalence of an S3 was over threefold higher in decompensated heart failure (41.3%) than in non-heart failure patients (13.2%). The prevalence of an S4, while much smaller in magnitude, was also higher in decompensated heart failure (17.4%), than in non-heart failure (5.9%). While the differences were not as marked, those patients with a secondary diagnosis (28.6%) of heart failure also had an increased prevalence of S3 when compared to the group with a non-heart failure diagnosis.

CONCLUSIONS

This study suggests that patients with decompensated heart failure are much more likely to have abnormal diastolic heart sounds than patients with dyspnea not related to heart failure. When present, abnormal diastolic heart sounds should alert the physician to an increased likelihood of decompensated heart failure.



Figure 2 Placement of the AUDICOR sensors.