

## Seasonal Variations in Hospital Admission in Patients with Heart Failure and its Effect on Prognosis

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**Background:** A seasonal variation in hospital admissions in patients with heart failure (HF) has been described and most admissions occur during the winter season. The effect of this seasonal variation on prognosis is less clear.

**Objectives:** To evaluate the effect of the seasonal timing of hospital admission on clinical outcome in patients with HF.

**Methods:** We prospectively enrolled 362 consecutive patients hospitalized with a definite clinical diagnosis of HF during a two year period. Patients were followed clinically for a period of one year.

**Results:** There was a prominent seasonal variation in hospital admissions in patients with HF with peak admissions during the winter. The admission rate inversely correlated with the average monthly temperature. Regression analysis demonstrated a highly significant inversion correlation between mean temperature and admission rate ( $R^2=0.77$ ,  $P<0.0001$ ). Admission during the summer season was a significant predictor of reduced survival (59% versus 75%,  $P<0.01$ ). Cox regression analysis demonstrated that independent predictors of reduced survival after adjustment for other predictors were admission during the summer (HR 1.9, 95% CI 1.1-3.4,  $P<0.05$ ) or admission during the hottest 6 months (HR 1.9, 95% CI 1.2-3.0,  $P<0.01$ ). In addition, increased mean environmental admission temperature was an independent predictor of reduced survival. The higher the temperature ( $10^\circ\text{C}$  increments), there was increased mortality (HR 1.6, 95% CI 1.3-2.0,  $P<0.0001$ ). In addition, there was a two fold increase in mortality in patients admitted when the temperature was above  $18.5^\circ\text{C}$  (HR 2.0 CI 1.3-3.0,  $P<0.001$ ).

**Conclusions:** Seasonal temperature has a significant effect on the rate of hospital admission in patients with HF. Admission during the summer months is a sign of a poor prognosis.

