

**Elevated Resting Heart Rate is a Marker of Subclinical Left Ventricular Dysfunction in Hodgkin Lymphoma Survivors**

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**Purpose:**

Thoracic irradiation is one of the cornerstones of Hodgkin lymphoma (HL) treatment, which contributes to high rates of long-term survivorship, but begets a life-long increased risk of heart disease including heart failure. At the cardio-oncology (CO)-clinic, persistent sinus tachycardia or elevated resting heart rate (RHR) is frequently observed in these patients. The aim of this study was to evaluate the relation between RHR and left ventricular (LV) dysfunction.

**Methods:**

In 75 HL survivors visiting our CO-clinic echocardiographic evaluation of LV systolic and diastolic function including global longitudinal strain (GLS) was performed to assess subclinical LV dysfunction. RHR was determined after 10 minutes of supine rest during echocardiography.

**Results:**

Median age of HL diagnosis was 24 [19,29] years with a 17 [12,25] year interval to CO-clinic visit and 31 patients (41%) were male. Average RHR was  $78 \pm 14$  bpm and 40% of patients (N=30) had an elevated RHR defined as  $\geq 80$  bpm. While there was no difference in LV ejection fraction ( $55.6 \pm 4.3$  vs.  $54.8 \pm 6.6$ ;  $p=0.543$ ), patients with elevated RHR had reduced GLS ( $-15.9\%$  vs.  $-18.3\%$ ,  $p=0.045$ ) and higher prevalence of diastolic dysfunction ( $73.3\%$  vs.  $46.7\%$ ;  $p=0.022$ ). GLS, E/e' ratio and presence of diastolic dysfunction were independently associated with RHR when correcting for age, sex and mantle field irradiation.

**Keywords:**

Cardio-oncologie, Heart failure, Resting heart rate Cardio-oncologie

Abstract sessies Online NVVC Voorjaarscongres  
Woensdag 7, donderdag 8 en vrijdag 9 april 2021

**Figure:**

Example of two patients where (top) during echocardiographic examination, which shows that patient B has an increased RHR. (middle) Strain imaging analysis with "Bulls Eye plot" in addition to conventional markers of systolic and diastolic LV function reveal that patient B has both systolic and diastolic LV dysfunction. (below) Mean and 95% CI of resting heart rate in the study population by diastolic function (left) and global longitudinal strain (right).

