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ORIGINAL ARTICLE

The importance of the neutrophil-to-lymphocyte ratio in patients with hypertrophic cardiomyopathy

Sinem Ozyilmaz[a], Ozgur Akgul[b], Huseyin Uyarel[c], Hamdi Pusuroglu[b], Mehmet Gul[b], Muhammet Hulusi Satilmisoglu[b], Ismail Bolat[d], Isa Ozyilmaz[e,*], Hakan Uçar[a], Aydin Yildirim[b], Ihsan Bakir[f]

[a] *Biruni University, School of Medicine, Department of Cardiology, Istanbul, Turkey*
[b] *Mehmet Akif Ersoy Thoracic and Cardiovascular Surgery Training and Research Hospital, Department of Cardiology, Istanbul, Turkey*
[c] *Bezmialem Vakıf University, School of Medicine, Department of Cardiology, Istanbul, Turkey*
[d] *Fethiye State Hospital, Department of Cardiology, Mugla, Turkey*
[e] *Mehmet Akif Ersoy Thoracic and Cardiovascular Surgery Training and Research Hospital, Department of Pediatric Cardiology, Istanbul, Turkey*
[f] *Mehmet Akif Ersoy Thoracic and Cardiovascular Surgery Training and Research Hospital, Department of Cardiovascular Surgery, Istanbul, Turkey*

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KEYWORDS
Hypertrophic cardiomyopathy;
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Abstract
Introduction: Previous studies have demonstrated the predictive value of the neutrophil-to-lymphocyte ratio (NLR) in many cardiovascular disorders. The aim of this study was to assess whether NLR is associated with echocardiographic or electrocardiographic parameters, or with predicted five-year risk of sudden cardiac death (SCD), in patients with hypertrophic cardiomyopathy (HCM).
Methods: This prospective observational study included 74 controls and 97 HCM patients. Three years of follow-up results for HCM patients were evaluated.
Results: NLR was significantly higher in patients with fragmented QRS, ventricular tachycardia, and presyncope than in those without (p=0.031, 0.030, and 0.020, respectively). NLR was significantly higher in patients whose predicted five-year risk of SCD was more than 6% and whose corrected QT interval was greater than 440 ms (p=0.022 and 0.001, respectively). It was also significantly higher in patients whose left ventricular ejection fraction (LVEF) was <60% than in those with LVEF >60% (p=0.017).
Conclusion: NLR was significantly higher in patients with HCM compared to the control group. A high NLR is associated with a higher five-year risk of SCD in patients with HCM.

* Corresponding author.
E-mail address: isaozyilmaz@gmail.com (I. Ozyilmaz).

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PALAVRAS-CHAVE
Miocardiopatia hipertrófica;
Relação neutrófilos/linfócitos;
Score de risco a cinco anos de morte súbita cardíaca

A importância da relação neutrófilos/linfócitos em doentes com miocardiopatia hipertrófica

Resumo
Introdução: Estudos prévios demonstraram o valor preditivo da relação neutrófilos/linfócitos (RNL) em muitas alterações cardiovasculares. O objetivo deste estudo foi avaliar se a RNL está associada a parâmetros ecocardiográficos ou eletrocardiográficos, ou com o *score* de risco de morte súbita cardíaca (MSC) a cinco anos em doentes com miocardiopatia hipertrófica (MCH).
Métodos: Este estudo prospetivo observacional incluiu 74 controlos e 97 doentes com MCH. Foram avaliados os resultados dos doentes com MCH ao longo de três anos de seguimento.
Resultados: O valor da RNL foi significativamente superior nos doentes com QRS fragmentado, com taquicardia ventricular e com pré-síncope do que nos que não revelaram esses sinais (valores p: 0,031, 0,030, 0,020, respetivamente). O valor RNL foi estatística e significativamente superior nos doentes com risco de MSC previsível a cinco anos superior a 6%, e com um intervalo QT corrigido superior a 440 ms (valores p: 0,022, 0,001, respetivamente). O valor da RNL foi significativamente superior nos doentes com fração de ejeção (FE) < 60% do que nos doentes com FE > 60% (valor p = 0,017).
Conclusão: A RNL foi significativamente superior nos doentes com MCH quando comparada com o grupo controlo. Uma RNL alta está associada a um *score* de risco de MSC elevado aos cinco anos em doentes com MCH.

Introduction

Hypertrophic cardiomyopathy (HCM) is a relatively common genetic cardiac disorder that can appear at any age. It affects men and women equally and is a leading cause of sudden cardiac death (SCD), especially in young adults.[1] This is the most devastating result of its natural history. Although there have been numerous studies of HCM patients, no risk stratification strategy will ever be able to predict SCD with absolute certainty.

The neutrophil-to-lymphocyte ratio (NLR) is an easily accessible and widely available novel hematological marker of oxidative stress damage. It also serves as a good prognostic marker and has been studied in patients with infectious diseases, as well as in cases of oncological, hematological, immunological, and cardiac disorders, using a complete blood count, the most commonly performed test in hospitals. Previous research has revealed that it has significant prognostic value, in addition to various positive correlations. The predictive value of NLR in peripheral arterial disease and calcific aortic stenosis, as well as in prognostication of the presence, severity, and extent of coronary artery disease, heart failure, and many other cardiovascular disorders has already been demonstrated.[2,3] A high NLR is associated with poor prognosis in the majority of studies. Although the relationship between NLR and almost all cardiovascular disorders has been investigated, the importance of NLR in HCM remains unclear. To the best of our knowledge, few studies have been conducted on the prognostic significance of the correlation between NLR and HCM.

In this study, we aimed to assess whether the presence of high NLR is associated with poor prognosis in HCM and whether NLR is associated with echocardiographic parameters, cardiac arrhythmia, or predicted five-year risk of SCD.

Methods

Patient population

This prospective observational study included a consecutive sample of 97 patients with HCM and 74 age- and gender-matched controls without HCM who presented to Mehmet Akif Ersoy Thoracic and Cardiovascular Surgery Center, Training and Research Hospital, and to the School of Medicine at Bezmialem Vakif University, between December 2012 and November 2015. Three years of follow-up results of patients with HCM were evaluated. The study was approved by the ethics committee of the School of Medicine at Bezmialem Vakif University, and all participants gave their written informed consent.

The study inclusion criteria were age >17 years and echocardiography or cardiac magnetic resonance imaging (CMRI) revealing HCM, defined as left ventricular (LV) wall thickness of at least 15 mm in one or more LV myocardial segments.[4] In those with lesser degrees of wall thickening (13-14 mm) with a high possibility of HCM, we evaluated other factors, including family history, positive gene mutations, and abnormalities on the electrocardiogram (ECG).

Patients with hypertension (n=8), renal failure (n=2), history of myocardial infarction (n=1), aortic valve stenosis (n=1), and active inflammation or chronic inflammatory diseases (n=2), were excluded from the study, resulting in a final population of 97 patients.