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# Severity-dependent variations of the neutrophil to lymphocyte ratio (NLR) in peripheral vestibular vertigo

Andi Kurnia Bintang\* and Eva lin Magasingan

## Abstract

**Background:** Peripheral vestibular vertigo is a common cause of vertigo especially in the elderly. The neutrophil to lymphocyte ratio (NLR) is a rapid and cost-effective inflammatory marker that has been assessed previously in peripheral vestibular disorders. However, its relation to the severity of peripheral vertigo has not been previously investigated. The aim of this study is to assess the levels of NLR in peripheral vestibular vertigo of various severity categories. This was a cross-sectional study at the Wahidin Sudirohusodo Hospital and Hasanuddin University Teaching Hospital in Makassar. The NLR was measured among subjects with peripheral vestibular vertigo with severity categorised using the Dizziness Handicap Inventory (DHI) questionnaire.

**Results:** A total of 39 participants with peripheral vestibular vertigo were recruited. A statistically significant difference was found ( $p = 0.002$ , Kruskal–Wallis ANOVA) between the mean NLR for the mild, moderate, and severe DHI categories were  $2.47 \pm 1.66$ ,  $2.64 \pm 0.96$ , and  $5.15 \pm 2.59$  respectively.

**Conclusion:** A significant difference in the NLR was found between the three different vertigo severity groups, wherein NLR values rise with increase in vertigo severity. This warrants further exploration on the role of inflammatory biomarkers in vertigo pathophysiology and clinical assessment.

**Keywords:** Inflammation, Neutrophil to lymphocyte ratio, Peripheral vestibular vertigo

## Introduction

Vertigo is a phantasm of movement, mostly that of whirling motion, though patients may describe it as a feeling of linear movement or tilt [1]. Peripheral vestibular vertigo is induced by abnormalities of the peripheral vestibular system, semicircular canals, and vestibular nerves. It is mostly caused by dislodging otoconia, endolymphatic hydrops, inner ear viral infection, or trauma of the bony labyrinth or the oval and round window. Vertigo can present as a collection of symptoms consisting of dizziness, nausea, vomiting, nystagmus and unsteadiness.

Complaints of vertigo affect about 20–30% of the general population, and is more likely to affect females [2]. Vertigo is more frequent in the elderly relative to younger age groups and is the most common complaint in people over 75 years [3]. About 80% of people who experience vertigo report that the complaint interferes with their daily activities, as it impedes with the ability to work, and results in an increased risk of falling and the high use of health services with downstream impact on economic costs [4].

The severity index of vertigo is often measured by the intensity and frequency of the vertigo attacks. However, severity is a multidimensional concept that may not be fully explained solely by the intensity and frequency of symptoms. Emotional, functional and physical disturbances caused by vertigo can be assessed by the Dizziness Handicap Inventory (DHI) score [5]. In 2004,

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