

## Serum Endocan Level, Mean Platelet Volume and Neutrophil to Lymphocyte Ratio in Patients with Erectile Dysfunction: a narrative review

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### ABSTRACT

**Background:** ED is disease with several potential causes, including high blood pressure and diabetes. Serum endocan, MPV, and NLR are only a few of the biomarkers suggested to measure the severity of this inflammatory response. The goals of this study are to examine the relationship between erectile dysfunction and serum endocan level, mean platelet volume, and neutrophil-to-lymphocyte ratio. Serum endocan Level, Mean Platelet Volume, and Neutrophil to Lymphocyte Ratio in patients with erectile dysfunction were retrieved from the Medline databases (Pub Med and Medscape) until the year 2022. Research Studies were chosen after being objectively evaluated by two reviewers. If they met any of the following criteria, we considered them for inclusion: First, it must be written in English. 2. Appearing in journals with a strict peer review process. Third, explain why serum endocan, MCV, and the neutrophil-to-lymphocyte ratio are important in ED patients. Extraction of Data: Research Studies were not included if they did not meet the inclusion criteria. Ethical permission, eligibility criteria, controls, information, and well-defined evaluation measures were all factors in determining the study's quality. Our concerned research results were captured by independently abstracting data utilising a data collecting form from each qualifying study. We conclude that Endocan, MPV, and NLR are indicators implicated in the pathogenesis of ED in individuals with diabetes and hypertension. Endocan and MPV are markers of erectile dysfunction severity in people with diabetes and hypertension.

**Keywords:** endocan, erectile dysfunction, mean platelet volume, neutrophil/lymphocyte ratio.

### 1. Introduction

Erectile penile erection necessary for optimal sexual performance for at least 6 months is a hallmark of erectile dysfunction (ED) (Wang et al., 2019) 1. ED has a complex set of causes, some of which are long-term conditions including hypertension (HT) and diabetes mellitus (DM) (Akdemir et al., 2019) Second, vascular illnesses and other organic diseases are the leading causes of ED in elderly men (Sambel et al., 2018) Third, endocan is a new soluble dermatan sulphate proteoglycan that originates from the endothelium (Bessa et al., 2020) A key player in inflammatory processes, it is also engaged in endothelial cell rearrangement, adhesion, migration, proliferation, and angiogenesis (Nalewajska et al., 2020) Five, endocan can foresee endothelial dysfunction (Onuk et al., 2018) Six, illnesses including diabetes and hypertension have been linked to abnormal endocan levels. Endothelial activation and neovascularization are prominent pathophysiological changes associated with inflammation and tumour growth, and a rise in tissue expression or serum levels of endocan reflects these changes (Wang et al., 2019) 1. Platelet activation and functional changes may be predicted using mean platelet volume. The levels of MPV tend to rise in several disorders, including hypertension, diabetes, and others.

Kalliopi et al. (2019). 7. Problems of ED often manifest two to five years before to the onset of cardiovascular symptoms. The cavernous arteries are only around 1-2 mm in diameter, whereas the coronary arteries are about 3-4 mm. An early sign of cardiovascular disease, vasculogenic ED has been proposed (Crafa et al., 2020) Furthermore, the ratio of neutrophils to lymphocytes might reveal systemic inflammation (González et al., 2018). 9 Atherosclerosis formation and progression are both heavily influenced by chronic arterial wall inflammation (Gencer et al., 2021) Atherosclerotic risk factors, like diabetes and hypertension, may influence the NLR 10. (Moghanjoughi et al., 2022) Eleven. The NLR may prevent ED and cardiovascular disease by blocking many pathophysiological pathways that contribute to these conditions, including moderate systemic inflammation. Multiple inflammatory mediators, such as Myeloperoxidase (MPO) and reactive oxygen species (ROS), are produced and secreted by neutrophils and may contribute to cardiac and non-myocardial tissue damage (Nishida et al., 2017) 12.

### 2. Materials and methods

**Data Sources:** By Serum endocan Level, Mean Platelet Volume, and Neutrophil to Lymphocyte Ratio in Patients with Erectile

Dysfunction, Searching and Reviewing Medline Databases (Pub Med and Medscape) Available Until 2022.

Choice of Studies: Each study that was considered for inclusion was reviewed separately. If they met any of the following criteria, we considered them for inclusion: First, it must be written in English. 2. Appearing in journals with a strict peer review process. Third, explain why serum endocan, MCV, and the neutrophil-to-lymphocyte ratio are important in ED patients.

Data Mining: Studies were not included if they did not meet the inclusion criteria. Ethical permission, eligibility criteria, controls, information, and well-defined evaluation measures were all factors in determining the study's quality. Our concerned research results were captured by independently abstracting data utilising a data collecting form from each qualifying study.

Third, a literature review:

Male sexual dysfunction in people with diabetes

Endothelial dysfunction, accumulation and increased advanced glycation end products (AGEs), impaired nitric oxide (NO) synthesis, increased endothelin B receptor binding sites, oxidative stress, autonomic neuropathy, the Rho/Rho kinase regulation signalling pathway, impaired cyclic guanosine monophosphate, and impaired cyclic guanosine monophosphate are all involved in the pathophysiology of ED in (cGMP). Alterations in the cavernous bodies' smooth muscle's structure and function, as well as hormonal shifts, also play a role (Ibrahim, 2019) Hypertensive patients with erectile dysfunction

In hypertensive individuals, erectile dysfunction may be caused by an aberrant response to contractile stimuli like AngII and ET-1, or a reduced response to NO and other stimuli that induce relaxation of penile vascular smooth muscle. Reduced reactivity to vasodilator mediators and greater sensitivity to vasoconstrictor molecules are symptoms common to both ED and endothelial dysfunction (Gokhan et al., 2018) 14.

Potential inflammatory indicators in vascular disease include endocan, macrophage polarisation molecule 2, and neutrophil elastase-like receptor, and inflammation is a key player in the development of vascular endothelial dysfunction and atherosclerosis (Pujani et al., 2022)

15. Patients with diabetes and hypertension have been shown to have a negative association between serum endocan and ED severity as measured by IIEF-5, as described by Akarsu et al. (2018)16. Studies

by Balta et al. (2015)19, Onuk et al. (2018)6, and Wang et al. (2015)20 and Elkamshoushi et al. (2018)6 all found similar things.

El Taieb et al. (2019)26, Otunctemur et al. (2015)25, Tangal et al. (2020),21 Bayraktar et al. (2017)22, Sönmez et al. (2017)23, Aldemir et al. (2016)24, and Otunctemur et al. (2015)25 all observed substantially higher MPV levels in vasculogenic ED patients than in controls (arterial, venous, or mixed).

No statistically significant variations in MPV values were found between ED patients and healthy controls, as reported by Sentürk et al. (2018)27.

Several studies have shown a negative relationship between MPV and IIEF score, including one by Tangal et al. (2020), another by El Taieb et al. (2019), and still another by Culha et al. The severity of ED was not linked to MPV by either Ciftci et al. (2013)29 or Sentürk et al. (2018)27.

Numerous studies, including those by Liao et al. (2021)30, Sambel et al. (2018)31, Karabakan et al. (2019)18, Bozkurt et al. (2020), Aslan et al. (2019)33, and Alcaindinho et al. (2021)34, have shown elevated NLR in ED and drawn the conclusion that NLR is a reliable predictor of ED.

While we found a correlation between NLR and ED, Akbas et al. (2016)35 found no such link.

According to Sambel et al. (2018)31 and Ventimiglia et al. (2018)36, NLR levels are inversely linked with IIEF-5.ED severity.

#### 4. Conclusion

Our findings suggest that serum endocan, MPV, and NLR can be used to evaluate ED severity.

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