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COMPARISON OF DAY TIME AND NIGHT TIME BLOOD PRESSURE VARIABILITY IN PATIENTS WITH ARTERIAL HYPERTENSION

Introduction

Arterial hypertension is one of the most widespread chronic health conditions in the world and remains a major contributor to cardiovascular illness and death. It plays a key role in the development of coronary artery disease, stroke, heart failure, and kidney damage. Even with modern treatment options, hypertension continues to be a leading cause of premature mortality and long-term health complications [1, 2].

Under normal conditions, blood pressure follows a daily (circadian) rhythm: it rises during daytime activities and falls during nighttime sleep. This nighttime decrease, known as the normal dipping pattern, reflects healthy autonomic and cardiovascular regulation. In many patients with arterial hypertension, however, this natural pattern is disrupted. Instead of a normal decline, blood pressure may fall only slightly or even rise during sleep. Such disturbances can appear even in young individuals with uncomplicated hypertension [3].

Abnormal nighttime blood pressure patterns and increased variability in blood pressure levels are linked to a higher risk of cardiovascular complications and damage to target organs. Research shows that nighttime blood pressure is often a stronger predictor of cardiovascular risk than daytime measurements alone [4]. Because of this, 24-hour ambulatory blood pressure monitoring (ABPM) has become an essential tool for detecting these patterns and accurately assessing cardiovascular risk [5].

Understanding how blood pressure variability differs between daytime and nighttime in patients with hypertension is important for improving diagnosis, risk evaluation, and treatment planning. Early detection of abnormal blood pressure patterns may help prevent complications and improve long-term outcomes [6].

Goal

The goal of this article is to compare daytime and nighttime blood pressure variability in patients with arterial hypertension using ambulatory blood pressure monitoring among 40 hypertensive patients, in order to assess differences in circadian blood pressure patterns and their potential clinical significance.

Material and methods of the research

This study was carried out using clinical data from 40 patients diagnosed with arterial hypertension. All patients underwent 24-hour ABPM as part of their routine clinical examination to assess their daily blood pressure patterns under normal conditions.

The collected data included patient demographic information, as well as mean systolic and diastolic blood pressure values recorded during both daytime and nighttime. Blood pressure variability indices were also analyzed, and patients were classified based on their circadian blood pressure patterns.

All data were entered and analyzed using Microsoft Excel. A quantitative analysis was performed to compare daytime and nighttime blood pressure variability in patients with arterial hypertension.

The results of the research and their discussion

This analysis explores how blood pressure variability (BPV) differs across circadian blood pressure patterns, based on the data presented in tables 1 and 2.

Patients were categorized into four groups according to their nocturnal systolic blood pressure (SBP) dipping patterns (table 1). The most common profile was the non-dipper pattern, observed in 21 patients (52.5%). This was followed by dippers (12 patients, 30.0%), night-peakers (6 patients, 15.0%), and over-dippers (1 patient, 2.5%). These findings indicate that a substantial majority of the cohort (70%) exhibited an abnormal nighttime blood pressure regulation pattern, with the non-dipper pattern being the most prevalent.

Table 1 – Blood Pressure Variability in Daytime and Nighttime Periods (M±SD)

Circadian Profile (by SBP)	n (%)	Daytime SBPV (mmHg)	Nighttime SBPV (mmHg)
Dippers	12 (30.0)	16.6±3.1	13.9±5.4
Non-dippers	21 (52.5)	17.1±6.9	15.5±6.3
Over-dippers	1 (2.5)	28.0±0	12.0±0
Night-peakers	6 (15)	14.6±6.0	15.5±7.2

Table 1 reveals distinct relationships between circadian dipping status and blood pressure variability (BPV). Patients with a dipper pattern demonstrated a healthy reduction in variability at night, decreasing from 16.6±3.1 mmHg during the day to 13.9±5.4 mmHg at night. In contrast, non-dippers showed persistently elevated nighttime variability (15.5 ± 6.3 mmHg), which was nearly as high as their daytime levels, indicating a lack of cardiovascular rest during sleep. The single over-dipper in this cohort presented a unique profile with very high daytime variability (28.0 mmHg) that normalized to a low level at night (12.0 mmHg). Night-peakers exhibited a pattern where nighttime variability (15.5±7.2 mmHg) was actually higher than their daytime variability (14.6±6.0 mmHg), suggesting a state of continuous or even increased blood pressure fluctuation during sleep.

The comparative data on the overall BP variability are presented below (table 2).

Table 2 – SBP Variability According to Circadian Profile Type (M±SD)

Parameter	Daytime (mmHg)	Nighttime (mmHg)	p-value
SBP Variability	16.9±6.0	14.9±6.0	0.08
DBP Variability	12.5±4.9	16.8±20.5	0.30

According to table 2, systolic blood pressure variability (SBPV) was higher during daytime hours than at night, but this difference did not reach statistical significance (16.9±6.0 mmHg vs. 14.9±6.0 mmHg; p=0.08). This trend aligns with the expected influence of the sleep-wake cycle but suggests a more heterogeneous response within the study group. Diastolic blood pressure variability (DBPV) showed a paradoxical and non-significant trend towards higher variability at night, a finding heavily influenced by the large standard deviation (16.8±20.5 mmHg), which indicates extreme variability among individual patients. These results underscore the high prevalence of abnormal circadian patterns and the complex nature of blood pressure variability in this hypertensive cohort.

Conclusions

Abnormal circadian blood pressure patterns were common in the studied population. The non-dipper pattern was the most frequent (52.5%), followed by night-peakers (15.0%). This distribution suggests that impaired nocturnal blood pressure regulation is highly prevalent and may represent an underrecognized cardiovascular risk factor in this cohort.

Continuous 24-hour blood pressure monitoring, including assessment of dipping status and variability, is essential for accurate cardiovascular risk evaluation. Incorporating ambulatory blood pressure monitoring into routine risk assessment programs could help identify individuals at higher risk, particularly those with non-dipping patterns or elevated nighttime variability. Early detection and targeted interventions may reduce target organ damage and improve long-term cardiovascular outcomes.

LITERATURE

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CORRELATION OF NEUTROPHIL-TO-LYMPHOCYTE RATIO WITH CHILD-PUGH SCORE IN PATIENTS WITH LIVER CIRRHOSIS

Introduction

Liver cirrhosis is a major cause of morbidity and mortality worldwide. It represents the end-stage of chronic liver disease, characterized by progressive fibrosis and the development of complications such as ascites, variceal bleeding, and hepatic encephalopathy. The Child-Pugh score remains one of the most widely used tools for assessing disease severity and predicting prognosis in cirrhosis patients. It incorporates five parameters: serum bilirubin, serum albumin, prothrombin time/INR, presence of ascites, and presence of hepatic encephalopathy.

Systemic inflammation is increasingly recognized as a key driver of cirrhosis progression. Mechanisms such as gut dysbiosis, bacterial translocation, and endotoxemia contribute to a persistent pro-inflammatory state that accelerates disease decompensation. The Neutrophil-to-Lymphocyte Ratio (NLR), derived from the routine complete blood count, has emerged as a cost-effective marker of systemic inflammation. Elevated NLR has been associated with poor outcomes in various chronic diseases, including cardiovascular disease, malignancy, and chronic liver disease.

Goal

The primary goal of this study is to investigate the correlation between the Neutrophil-to-Lymphocyte Ratio (NLR) and the Child-Pugh score in 20 patients diagnosed with liver cirrhosis.