



## **World Conference on Social Sciences, Law and Public Policy**

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### **EPIDEMIOLOGICAL ANALYSIS OF THE ASSOCIATION BETWEEN GEOMAGNETIC STORMS AND ARTERIAL HYPERTENSION ATTACKS AND THE DEVELOPMENT OF PREVENTIVE MEASURES**

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#### **Introduction**

Cardiovascular diseases (CVD) remain one of the leading causes of mortality worldwide. According to global epidemiological data, millions of people die each year as a result of cardiovascular pathologies. In recent years, it has been emphasized that not only traditional risk factors (smoking, obesity, physical inactivity, and unhealthy diet), but also atmospheric and cosmic environmental factors may play an important role in the development of these diseases.

Geomagnetic storms occur as a result of solar flares and coronal mass ejections. These processes cause strong electromagnetic disturbances in the Earth's magnetosphere. Studies indicate that geomagnetic activity may influence biological rhythms in the human body as well as the functioning of the cardiovascular system.

Several epidemiological studies have reported that increases in geomagnetic activity are associated with elevated arterial blood pressure levels and a higher incidence of cardiovascular events.

Over the past decades, numerous epidemiological studies have been conducted to investigate the impact of geomagnetic storms on human health. Their findings



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suggest the presence of a certain relationship between geomagnetic activity and cardiovascular system indicators.

In studies conducted by Dimitrova and colleagues, a significant increase in average arterial blood pressure values was observed during periods of increased geomagnetic activity. According to the results of these studies, systolic and diastolic blood pressure values increased by approximately 9% during periods of heightened geomagnetic activity.

Other epidemiological observations have also reported that an increase in geomagnetic activity is accompanied by a rise in cardiovascular events, including myocardial infarction and stroke. Some meta-analyses have demonstrated that during geomagnetic storms the risk of myocardial infarction may increase by 1.3–1.5 times, while the risk of stroke may increase by 1.25–1.6 times.

Geomagnetic activity also affects heart rate variability. Studies have shown that during periods of strong geomagnetic disturbances, heart rate variability decreases, which is considered an independent risk factor for cardiovascular complications.

Moreover, certain epidemiological analyses have revealed a statistically significant correlation between geomagnetic activity indices and cardiovascular disease mortality ( $r = 0.72$ ;  $p < 0.001$ ).

The effects of geomagnetic storms on the human body can be explained through several biological mechanisms, including disturbances in autonomic nervous system regulation, alterations in circadian rhythms, decreased heart rate variability, changes in the rheological properties of blood, and impairment of microcirculation. These factors may contribute to the development of arterial hypertension attacks.



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### **Conclusion**

The analysis of scientific literature indicates the presence of a certain epidemiological association between geomagnetic storms and attacks of arterial hypertension. During periods of increased geomagnetic activity, elevated blood pressure levels, decreased heart rate variability, and an increased risk of cardiovascular complications have been observed.

An increased probability of arterial hypertension attacks has been reported during geomagnetic storms. Geomagnetic activity may influence the autonomic regulation of the cardiovascular system, leading to fluctuations in arterial blood pressure.

The development of preventive measures based on space weather monitoring is of considerable importance for reducing the risk of complications in patients with hypertension.

The following preventive measures are recommended:

- Regular monitoring of arterial blood pressure during periods of geomagnetic storms
- Reduction of stress and excessive physical exertion
- Administration of medications under medical supervision
- Monitoring of high-risk groups based on geomagnetic storm forecasts

### **References.**

1. Khan, M. A., Khan, S., & Khan, M. I. (2025). Exploring the potential observations between geomagnetic activity and cardiovascular events: A scoping review. *Cureus*, 17(1), e432069. <https://doi.org/10.7759/cureus.432069>
2. Matzka, J., Stolle, C., Yamazaki, Y., Bronkalla, O., & Morschhauser, A. (2021). The geomagnetic Kp index and derived indices



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- of geomagnetic activity. *Space Weather*, 19, e2020SW002641. <https://doi.org/10.1029/2020SW002641>
3. Mayrovitz HN. Linkages Between Geomagnetic Activity and Blood Pressure. *Cureus*. 2023 Sep 20;15(9):e45637. doi: 10.7759/cureus.45637. PMID: 37868483; PMCID: PMC10589055.
  4. Mayrovitz HN. Linkages Between Geomagnetic Activity and Blood Pressure. *Cureus*. 2023 Sep 20;15(9):e45637. doi: 10.7759/cureus.45637. PMID: 37868483; PMCID: PMC10589055.
  5. Jalolov, N. N., Sobirov, O. G., & Kabilzhonova, S. R. (2023). The role of a healthy lifestyle in the prevention of myocardial infarction.
  6. National Oceanic and Atmospheric Administration. (2024). Geomagnetic storms. *Space Weather Prediction Center*. <https://www.swpc.noaa.gov/phenomena/geomagnetic-storms>
  7. National Oceanic and Atmospheric Administration. (2024). Planetary K-index. *Space Weather Prediction Center*.
  8. Wang VA, Zilli Vieira CL, Garshick E, Schwartz JD, Garshick MS, Vokonas P, Koutrakis P. Solar Activity Is Associated With Diastolic and Systolic Blood Pressure in Elderly Adults. *J Am Heart Assoc*. 2021 Nov 2;10(21):e021006. doi: 10.1161/JAHA.120.021006. Epub 2021 Oct 29. PMID: 34713707; PMCID: PMC8751821.
  9. Jalolov, N. N. (2023). MIOKARD INFARKTI PROFILAKTIKASIDA SOG‘LOM TURMUSH TARZINING O‘RNI. In *E Conference Zone* (pp. 1-5).
  10. World Health Organization. (2025, September 25). Hypertension. *World Health Organization*. <https://www.who.int/news-room/fact-sheets/detail/hypertension> (who.int)