

THE CORRELATION BETWEEN SOLAR ACTIVITY AND PRIMARY MORBIDITY

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Introduction

In the early 20th century Alexandr Chizhevsky found the correlation between infectious epidemics and the solar activity. Some of them appear during high solar activity and their terminations occur during a minimum of the solar activity. Although the direct correlation was observed there were some exceptions. The average period of those epidemics is 11 years. Such period coincides with the duration of the solar activity cycle. Cyclic recurrence of both infectious and non-infectious diseases may give a great opportunity in prognosis of morbidity and mortality. That's why this topic may cause interests of doctors and scientists of different specialties.

Objectives

To study the influence of the solar activity on the primary morbidity in Russia during the last decades.

Methods

The data of Russian Federal Service of State Statistics (<http://www.gks.ru>) for primary morbidity of 9 selected groups in Russia from 2000 to 2014 was used for the retrospective analysis. The average annual number of sunspots published by the Centre for the influence of the Sun (Belgium, [http // www.sidc.be](http://www.sidc.be)) was used to assess the SA. For statistical evaluation we used the correlation coefficient (r), the probability of error (p), Student's t-test (t) as reliability criteria. Student's t-test must be more than 2,145 for this sample and $p=0,05$. Data processing was performed in Microsoft Excel.

Results

Medium direct correlation ($p=0,05$)	Strong inverse correlation ($p=0,05$)	Medium inverse correlation ($p=0,05$)	Weak correlation
Some infectious and parasitic diseases ($r=0,525$, $t=2,225$)	Cardiovascular diseases ($r= -0,710$, $t=3,639$)	Diseases of the musculoskeletal system and connective tissue ($r= -0,605$, $t=2,743$)	Tumors ($r= -0,375$, $t=1,457$)
	Diseases of the blood forming organs and certain disorders involving the immune mechanism ($r= -0,710$, $t=13,121$)	Diseases of the nervous system ($r= -0,556$, $t=2,409$)	Digestive diseases ($r= -0,079$, $t=0,286$)
	Diseases of the skin and subcutaneous tissue ($r= -0,871$, $t=6,399$)		Diseases of the respiratory system ($r= -0,095$, $t=1,243$)

Conclusions

The solar activity may have influence on the primary morbidity of both infectious and non-infectious diseases in Russia. Furthermore, the existence of correlation between some types of diseases and the solar activity can be used for prognosis of primary morbidity movement . On the other hand this problem requires further research.