The Spatial Distribution of The Physiological Parameters of SBP of Male Youth in China

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Abstract: With the change of regional climate and regional ecological environment, we become more concerned about the relationship between the Physiological Parameters of SBP and the geographic environment. In this paper, the relationship between Physiological Parameters of SBP of male youth and the geographical factors in China has been studied. We use three different kinds of models and selected seven different kinds of geographical factors in different areas of China to predict the Physiological Parameters of SBP of male youth, and we get the thematic map of the comparison of the predicted value and the real value, and we can see this in Figure 2. And we also use SPSS19.0 to get the Paired-Sample T test of the three predicted models, and we can see the result in Table 3. We got the special distribution regularity thematic map of the Physiological Parameters of SBP of male youth in China by using GIS software. We find the difference of the Spatial Distribution of Physiological Parameters of SBP of Male youth in China, and then we want to find the relationship between the incidence of the Physiological Parameters of SBP and the incidence of Cardio-cerebrovascular Diseases.

Keywords: physiological parameters of SBP; male youth; Cardio-cerebrovascular diseases; regression analysis.

1. Introduction

The incidence of morbidity and mortality rates of Cardio-cerebrovascular Diseases are the highest in China, which caused serious burden to society and family. There is a close relationship between the Cardio-cerebrovascular disease and the change of weather condition, which can cause the physiological and pathological changes of human body, and affect the incidence and development of cardio-cerebral vascular disease.

Many studies at home and abroad studied about the influence of cold air on Cardio-cerebrovascular disease, earlier studies used epidemiological method to statistic morbidity and mortality in patients with Cardio-cerebrovascular disease. When a typical cold air goes through, and statistical analysis is on the regional environmental factors that affect Cardio-cerebrovascular disease, or statistic the incidence and mortality of patients and the relationship between the meteorological elements changes with Cardio-cerebrovascular disease using epidemiological method.

Most of the research results indicate that: low temperature influence Cardio-cerebrovascular mainly by increasing blood deterioration degree, the number of red blood cells and fibrinogen levels, causing increased blood pressure, peripheral vascular contraction, and to increase blood flow resistance.

With the change of climate and ecological environment, we are more concerned about the relationship between the SBP Physiological Parameters and the geographic environment. SBP stands for Physiological Parameters of Systolic Blood Pressure, we use SBP as an abbreviation. And many people have studied the Normal Physiological Parameters of Systolic Blood Pressure, but they have not thematically studied the relationship between the Normal Physiological Parameters of Blood Pressure and the environment[1].

By searching through Hospitals of different areas of China and we have obtained many normal SBP Physiological Parameters of health male youth over China. We have collected 12367 SBP samples of health male youth in 30 provinces of china. The age are between 19 to 26.

We want to find the difference of the Spatial Distribution of Physiological Parameters of SBP of Male youth in China, and then we want to find the relationship of the incidence between the Physiological Parameters of SBP and Cardio-cerebrovascular Diseases.

2. Materials and Methods

2.1. Materials

We have collected the SBP Physiological Parameters(mmHg) of health male youth by searching through Hospital of different areas, about 12367 cases in 30 provinces of China. In the data we have collected, samples on the western part of China is less than the eastern part of China, information in cities of western part are less than big cities of eastern part.

Seven geographical data are collected for nearly three decades. The Geographical information we have collected includes altitude(m), annual mean air temperature(°C), annual sunshine duration(h), annual mean relative humidity(%), annual range of air temperature (°C), annual precipitation amount(mm), annual mean wind speed (m/s). Seven indexes that are closely related to physiological conditions of the provinces of China. The seven geographical factors are expressed as x1, x2, x3, x4, x5, x6, x7 in the following context.

Table 1. Value of r and p between geographical factors and the SBP Physiological Parameters

<table>
<thead>
<tr>
<th>Variable</th>
<th>R value</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>altitude(m)(x1)</td>
<td>-0.217</td>
<td>0.013</td>
</tr>
<tr>
<td>annual mean air temperature(°C)(x2)</td>
<td>-0.216</td>
<td>0.252</td>
</tr>
<tr>
<td>annual sunshine duration(h)(x3)</td>
<td>-0.139</td>
<td>0.463</td>
</tr>
<tr>
<td>annual mean relative humidity(%)(x4)</td>
<td>0.545</td>
<td>0.001</td>
</tr>
<tr>
<td>annual range of air temperature(°C)(x5)</td>
<td>0.513</td>
<td>0.003</td>
</tr>
<tr>
<td>annual precipitation amount(mm)(x6)</td>
<td>0.421</td>
<td>0.016</td>
</tr>
<tr>
<td>annual mean wind speed (m/s)(x7)</td>
<td>0.432</td>
<td>0.016</td>
</tr>
</tbody>
</table>
2.2. Methods

We collected about 12367 cases of the health male youth in 30 provinces of China, we used the Correlation analysis to find the correlation of the geographical factors and the SBP value of the male youth[1], we selected the regression analysis, the Curve analysis and the Main factor analysis altogether in order to get the best result. Through the Comparison of the Real value and the Predicted value[1], we selected the best forecast model through the comparison of different Analysis result of different models and we can see this from Figureure1 and table3.

Correlation coefficient is to study the relationship of variables, and describe the degree of relationship of different variables quantitatively. Correlation is a kind of not completely determine the number of dependent relationship, every numerical argument indicators may have several results mark, the value of the dependent variable and at the same time, the value but the relationship is not fixed, the value fluctuates up and down around their average. This paper uses the bilateral inspection P values, under the significance level of 0.01 is significant, P 0.01 or less shows very significant correlation between elements; 0.01 < P 0.05 or less shows significant correlation between elements; P > 0.05 shows no significant correlation between elements.

By using the mathematical correlation analysis, we get the single correlation coefficient between the normal SBP Physiological Parameters of male youth and the nine geographical factors, the correlation coefficient of altitude(m), annual mean air temperature(0C), annual sunshine duration(h),annual mean relative humidity(%),annual range of air temperature (0C), annual precipitation amount(mm),annual mean wind speed (m/s), can be calculated respectively in table1.

Through the SPSS19.0 statistical software, we take the seven geographic factors as independent variable, and we take the normal SBP Physiological Parameters of male youth (YSBP) as dependent variable. And then we get the function are as following:

\[
Y_{SBP} = 66.132 + 0.598x_3 + 0.321x_7
\]

\[
(R^2 = 0.598, F = 11.567, P = 0.000)
\]

Through the SPSS19.0 statistical software, we take the seven geographic factors as independent variable, and we take the normal SBP Physiological Parameters of male youth (YSBP) as dependent variable. And then we get the function.

\[
Y_{SBP} = 82.998*1.002x_7^2
\]

\[
(F = 14.048, P = 0.001)
\]

The KMO value is 0.639, it shows that these data we have collected is suitable for factor analysis. The associated probability in Bartlett is 0.000, less than the significance level 0.05. Through the SPSS19.0,we take the seven geographic factors as independent variable, and we take the Physiological Parameters of male youth(YSBP) as the dependent variable. And then we get the statistical result as shows in table2.

<table>
<thead>
<tr>
<th>Component</th>
<th>Initial Eigenvalues</th>
<th>Extraction Sums of Squared Loadings</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total</td>
<td>% of Variance</td>
</tr>
<tr>
<td>1</td>
<td>3.189</td>
<td>35.350</td>
</tr>
<tr>
<td>2</td>
<td>2.554</td>
<td>28.360</td>
</tr>
<tr>
<td>3</td>
<td>2.154</td>
<td>24.295</td>
</tr>
<tr>
<td>4</td>
<td>0.351</td>
<td>4.924</td>
</tr>
<tr>
<td>5</td>
<td>0.249</td>
<td>3.543</td>
</tr>
<tr>
<td>6</td>
<td>0.025</td>
<td>0.274</td>
</tr>
<tr>
<td>7</td>
<td>0.006</td>
<td>0.067</td>
</tr>
</tbody>
</table>

Table3 the T test result of the Real value and the Predicted value of male youth

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Linear Regression</th>
<th>Curve Estimate</th>
<th>Main Factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>t</td>
<td>0.000</td>
<td>0.079</td>
<td>0.086</td>
</tr>
<tr>
<td>P</td>
<td>1.000</td>
<td>0.969</td>
<td>0.912</td>
</tr>
</tbody>
</table>

And then we get the regression equation through several steps of computing, the specific operation process is eliminated because of the length of the article, and we finally get the following regression equation:
In the above equation, $Y_{SBP}$ is normal Physiological Parameters of Chinese male youth SBP (mmHg), $x_1$ is altitude(m), $x_2$ is annual mean air temperature(0C), $x_3$ is annual sunshine duration(h), $x_4$ is annual mean relative humidity(%), $x_5$ is annual range of air temperature (0C),$x_6$ is annual precipitation amount(mm),$x_7$ is annual mean wind speed (m/s).

3. Results

Through the SPSS19.0 statistical software, we take the seven geographic factors as independent variable, and we take the normal SBP Physiological Parameters of male youth ($Y_{SBP}$) as dependent variable. Through our analysis, we found that the Physiological Parameters of male youth is closely related with the geographical factors, ($F=11.567,P=0.000$). And the forecast model should be: $Y_{SBP}=66.132+0.598x_3+0.321x_7$; From Figureure1, we find that the best model that approaches the Real Value is the Linear Regression Model, so the Regression Model choose is chosen to be the best regression model. The regression equation can be used to represent the SBP Physiological Parameters of Chinese male youth.

In order to express the spacial distribution of the Physiological Parameters of SBP of the male youth in China. We chose 2466 counties, and we use the GIS special interpolation analysis to predict the Physiological Parameters by the equation we get. So we make the thematic map of the distributing tendency of the Physiological Parameters of different areas of china. we can also see this in Figureure2.

4. Discussion

When temperatures rise, by influencing the body temperature, blood deterioration degree and blood flow velocity, to produce pressure on heart and lungs, finally influence Cardio-cerebrovascular diseases. In addition, the low temperature stimulate the catecholamine secretion increased, resulting in Cardio-cerebrovascular convulsion, plaque rupture and the platelet aggregation cause thrombosis, finally cause Cardio-cerebrovascular disease.

In this paper, the normal SBP Physiological Parameters of male youth between geographical factors in China has been studied by using the special statistics analysis. We want to find the difference of the Spacial Distribution of Physiological Parameters of SBP of Male youth in China, and then we want to find the relationship between the incidence of the Physiological Parameters of SBP and Cardio-cerebrovascular Diseases.

We use the three different kinds of models and selected seven different kinds of geographical factors in different areas of China to predict the normal SBP Physiological Parameters of the male youth, and we get the thematic map of the comparison of the predicted value and the real value, we can see this in Figureure2. And we also use SPSS19.0 to get the Paired-Sample T test of the three predicted models, and we can see the result in table3.

Conflict of interest

The author confirms that this article content has no conflict of interest.

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