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Original Article

Association between pluviometric index and the occurrence of acute appendicitis

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ABSTRACT

Background: Epidemiological studies demonstrate, for unknown reasons, the prevalence of appendicitis in the summer and in young male adults, and there are controversies about its association with the rainy season. There are no studies in the State of Piauí about such association.

Objective: To establish an association between the occurrence of appendicitis and the pluviometric precipitation index.

Methodology: This is a cross-sectional study that was carried out using the database of the pathology service at a public emergency hospital in Piauí, and the pluviometric precipitation index in the State of Piauí from January 2009 to April 2014, with data from the National Institute of Meteorology. Descriptive statistics and association measures were applied using the Pearson correlation coefficient and the χ^2 test.

Results: We found a predominance of appendicitis cases in male subjects, from 11 to 20 years of age, with a predominance of the monthly mean of appendicitis cases in the second semester, which conforms to the dry season in the State of Piauí. Pearson's correlation coefficient was -0.260 .

Conclusion: There is an association between the occurrence of appendicitis and the months of the year; however, this is a weak negative correlation between the monthly mean of cases of appendicitis and monthly pluviometric precipitation average in the State of Piauí.

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Associação entre índice de precipitação e a ocorrência de apendicite aguda

R E S U M O

Palavras-chave:

Apendicite, associação
Precipitação atmosférica
Medidas de ocorrência de
doenças
Análise estatística

Contexto: Estudos epidemiológicos demonstram, por razões desconhecidas, o predomínio dos casos de apendicite no verão e em adultos jovens do sexo masculino, havendo controvérsias sobre sua associação com o período chuvoso. Não há estudos realizados no Piauí sobre esta associação.

Objetivo: Estabelecer uma associação entre a ocorrência de apendicite e o índice de precipitação pluviométrica.

Metodologia: Realizou-se um estudo transversal através do banco de dados do serviço de patologia de um hospital de emergência público do Piauí e do índice de precipitação no Piauí de janeiro de 2009 a abril de 2014 do Instituto Nacional de Meteorologia. Aplicou-se estatística descritiva e medidas de associação pelo coeficiente de correlação de Pearson e pelo teste qui-quadrado.

Resultados: Encontrou-se um predomínio dos casos de apendicite no sexo masculino, de 11 a 20 anos de idade, predomínio da média mensal de casos de apendicite no segundo semestre, coincidindo com o período de estiagem no Piauí. O coeficiente de correlação de Pearson foi de -0,260.

Conclusão: Existe uma associação da ocorrência de apendicite com os meses do ano, porém se trata de uma fraca correlação negativa entre a média mensal de casos de apendicite com a média da precipitação pluviométrica mensal estadual no Piauí.

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Introduction

The cecal appendix is a blind-end, tubuliform structure located in the large intestine. Its size is variable; it is estimated that the appendix measures, on average, 5 cm. The cecal appendix is believed to have absorptive, bacterial proliferation (to establish the intestinal flora balance), and immunity (through the production of white blood cells) functions. Nevertheless, its real function in the human species remains elusive.¹

Acute appendicitis is the most common surgical emergency in young adults, with a predominance of males. An incidence ratio of 1.4 men to 1 woman is estimated. In the United States, 11 out of 10,000 Americans will suffer from appendicitis throughout their lives. The etiology of appendicitis has not yet been fully elucidated. The most accepted theories are: viral, bacterial, fungal, and parasitic; but these theories are not exclusive and raise the need for pathophysiological and epidemiological clarifications.^{2,3}

The morbidity and mortality of acute appendicitis are directly related to the time of evolution, and its most common complication is its perforation. It is estimated that, after 36 h of evolution, the risk of perforation is 16–36%, with an increase of 5% in every 12 h. In turn, mortality is a consequence of the time of evolution, that is, the presence of perforation. When there is no perforation, mortality in patients with appendicitis is 0.08%. Otherwise, this percentage increases to 0.51%.³

The average costs of an appendectomy worldwide are of the order of US\$ 28,000. These costs do not take into account complications or an extended hospital stay. These values can reach more than US\$ 180,000.⁴

In Brazil, since 2003, the Brazilian government, through the Ministry of Health, has instituted the National Emergency and Urgency Plan, with the aim of organizing and structuring the country's emergencies. With respect to appendicitis, an abdominal pain protocol was developed with the aim of facilitating an early diagnosis, in order to promote, as quickly as possible, the patient's referral and treatment. The goal is always the same: to reduce morbidity and mortality, in order to promote humanization in care and reduce public health spendings.⁵

Recently, several epidemiological studies have reported a historical reduction in the occurrence of appendicitis, prevalence in individuals aged 10–19 years, and a seasonal behavior in its incidence.²

In most countries, appendicitis occurs more often in the summer months; but this season assumes very different aspects, depending on the continent and on the country, especially with regard to the pluviometric index.⁶ In Brazil, studies on this association were not recently published in Bireme; the last of these studies was published in 1992.⁷ The present study aims to investigate the existence of an association between pluviometric index in the State of Piauí and the occurrence of confirmed cases of acute appendicitis seen at public hospitals in Teresina – PI.

Methodology

This is a cross-sectional study of appendicitis cases covering the period from January 2009 to April 2014 and performed at the Hospital de Urgência de Teresina Prof. Zenon Rocha (HUT), at the Pathology Service and by consultation of the electronic

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