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SEASONAL VARIATION AND URETERIC COLIC IN CENTRAL SRI LANKA

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ABSTRACT

Introduction: Ureteric colic constitutes a major health problem worldwide and it has reported a prevalence rate 5–12% of the population during their lifetime. This study was designed to find the effect of weather changes on the occurrence of ureteric colic. **Materials and Methods:** This was a retrospective study done in Teaching Hospital, Peradeniya from January 2017 to December 2018. Climate data of the corresponding months were collected from Department of Meteorology recorded in the nearest weather station (Katugastota). The available monthly meteorological data included highest, lowest, and average temperature (measured in degree Celsius), average relative humidity (recorded in percentage), total rainfall (measured in millimeters). **Results**: The patients with ureteric colic constituted 5.41 % (1585/29292) of all patients admitted to the surgical wards, teaching hospital, Peradeniya within 2 years. There was a significant correlation between the mean monthly number of patients with ureteric colic and relative humidity (p: 0.036, r: -0.609), but not with maximum air temperature (p: 0.075, r: 0.532), minimum air temperature (p: 0.368, r: 0.285), average air temperature (p: 0.342, r: 0.342), total rainfall (p: 0.957, r: -0.018). **Conclusions**: A significant increase of colic was observed in the inter monsoon periods when weather changes from one climate season to the other.

KEYWORDS: Ureteric colic, Temperature, Average relative humidity, Rainfall, Sri Lanka.

INTRODUCTION

Ureteric colic constitutes a major health problem worldwide and it has reported a prevalence rate 5–12% of the population during their lifetime, and recurrence rates approach 50%.[1]

The etiology of ureteric colic is considered to be multifactorial including race, sex, body mass index, diet, volume of fluid intake, geographic localization, and climate changes.[2] Many reports have observed a seasonal variation in the occurrence of ureteric colic while others failed to find this variability. The relationship between the presentation of colic and higher temperature is commonly accepted in the literature.[3]

Climate changes in ureteric colic were first investigated in 1960, establishing that temperature and sunlight exposure, but not humidity, directly correlated with increased incidence.[4] Recent studies corroborated this relationship reporting that a higher incidence of stone disease occurred in the summer months, when temperature and sunlight exposure were at their maximum.[5]

This study was designed to find the effect of weather changes on the occurrence of ureteric colic.

MATERIALS AND METHODS

Methodology

We retrospectively reviewed the records of Teaching Hospital, Peradeniya from January 2017 to December 2018. Climate data of the corresponding months were collected from Department of Meteorology. We used the data recorded in the nearest weather station (Katugastota). The available monthly meteorological data included highest, lowest, and average temperature (measured in degree Celsius), average relative humidity (recorded in percentage), total rainfall (measured in millimeters).

Statistical analysis

Correlation and chi square test were performed to discover whether there is a relationship between variables. Statistical significance at $p< 0.05$ was accepted for all analysis. Data was analysed using Statistical Package for the Social Sciences (SPSS) version 20.

RESULTS AND DISCUSSION

One thousand five hundred and eighty five patients were included in our study during a period of 24 months. These patients constituted 5.41 % (1585/29292) of all patients admitted to the surgical wards, teaching hospital, Peradeniya within 2 years. 68.5% of patients were male and 31.5% of patients were female. Male/ female ratio was 2.2/1. There was a significant difference between female and male patients ($p < 0.001$). The average age of all patients was 42.17 ± 15.24 years. The average ages of male and female patients were 42.05 ± 14.79 years and 42.41 ± 16.16, respectively.

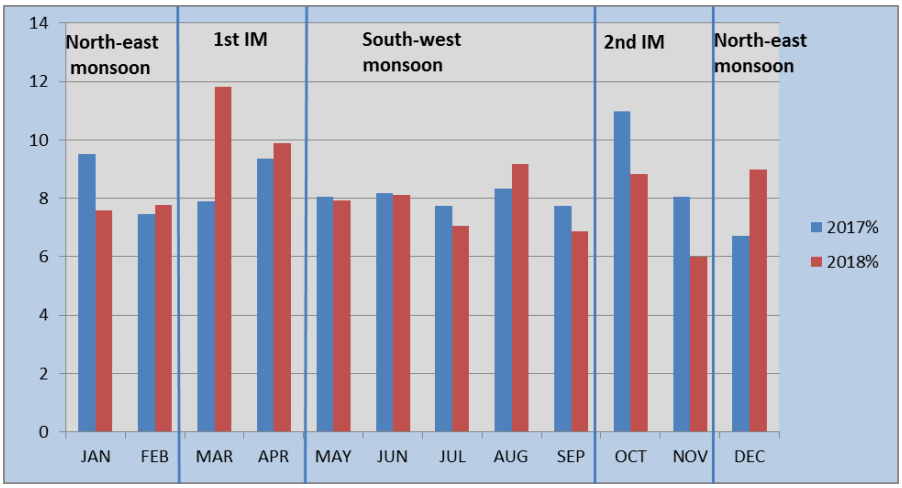

Figure 1: Presentation (incidence) of ureteric colic during 2017 & 2018.

The mean monthly number of patients presenting to the hospital with ureteric colic adjusted for 30 days a month is shown in figure 2.

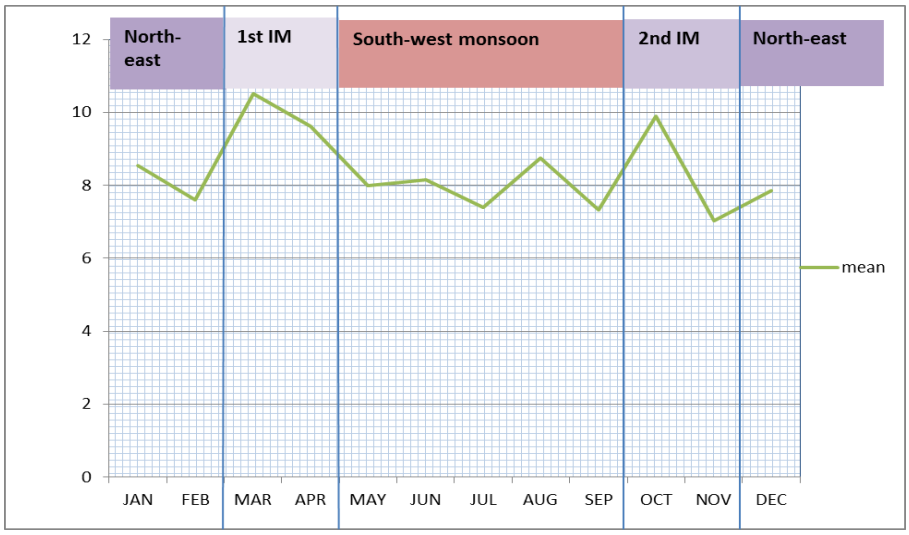

Figure 2: Presentation (incidence) of ureteric colic during 2017 & 2018.

Table 1: Correlation of variables with ureteric colic.

Variable	Significance(2 tailed)	Pearson correlation
Maximum air temperature	0.075	0.532
Minimum air temperature	0.368	0.285
Average air temperature	0.342	0.342
Total rainfall	0.957	-0.018
Relative humidity (night)	0.610	-0.164
Relative humidity (day)	0.036	-0.609

A study done in New York City (2007-2012) reported that temperature has a strong correlation with the calculi presentation rate, and relative humidity has a trend (P = 0.06) toward the overall calculi presentation rate.[6] Another study done in Japan has shown the similar results.[7]

Figure 3, 4 and 5 show the mean monthly air temperature, rainfall and relative humidity with the presence of ureteric colic during corresponding months.

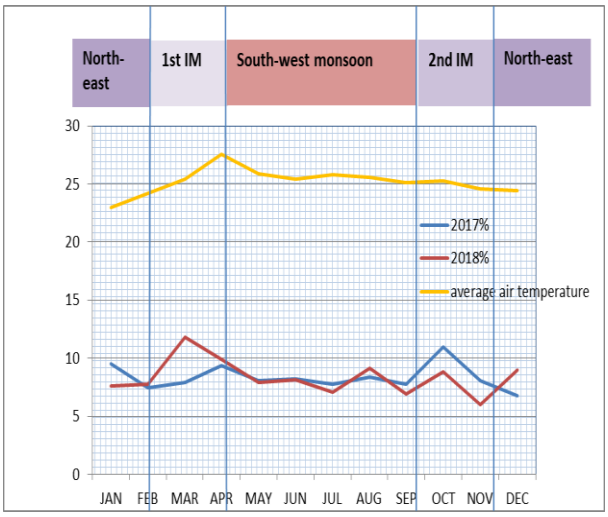

Figure 3: Average air temperature and colic.

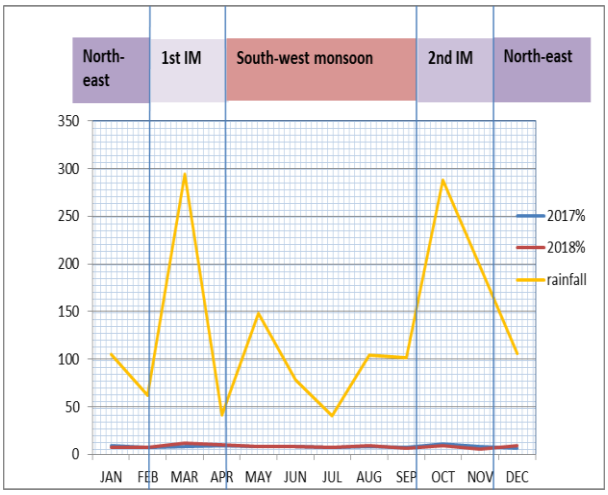

Figure 4: Average Rainfall and Colic.

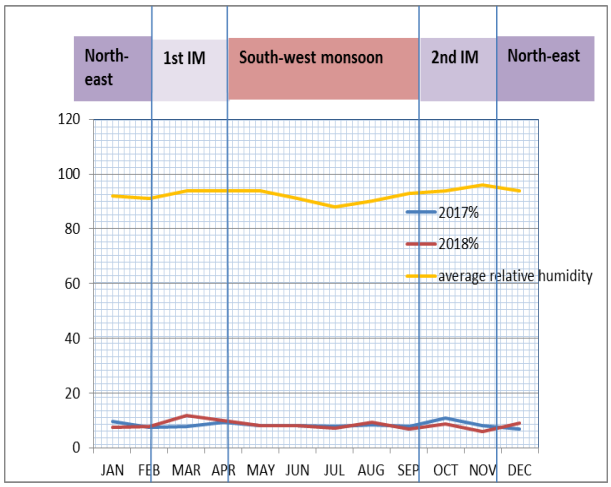

Figure 5: Average Relative Humidity and Colic.

It is seen that the effects of climatic changes on ureteric colic episodes in countries with different geographic features have been investigated and different results have been found. We found a significant correlation between the mean monthly number of patients with ureteric colic and relative humidity.

The association of relative humidity with worldwide trends of ureteric colic is clearly shown from this study. A previous study showed monthly average relative humidity has inverse correlation to total number of patients with ureteric colic in Taiwan. [8] This has important implications for healthcare planning, primary care prevention strategies and allocation of available resources.

CONCLUSIONS

The association of incidence of ureteric colic in Kandy district with seasonal variation is not significant as described in the literature, this could be due to the fact that there is no pronounce seasonal variation in Kandy. A significant increase of colic was observed in the inter monsoon periods when weather changes from one climate season to the other.

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