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SEASONAL VARIATION AND ACUTE URINARY RETENTION IN CENTRAL SRI LANKA

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ABSTRACT

Introduction: Acute urinary retention (AUR) is a sudden and painful inability to void urine despite having a full bladder. Understanding the seasonal variation of AUR is beneficial for the clinicians and health sector for the better outcome of management of the patients. **Materials and Methods**: This is a retrospective study done with the records of patients admitted to Teaching Hospital, Peradeniya from January 2017 to December 2019 for acute retention of urine. Climate data of the corresponding months were collected from Department of Meteorology. We used the data recorded in the nearest weather station (Katugastota). **Results**: We enrolled 600 patients who were admitted to Teaching hospital Peradeniya , Sri Lanka and there were 81.67 % males and 18.33% females who ranged from 1 to 96 years with an average age of 64.29 years. The highest incidence of acute urinary retention was recorded during south west monsoon in 2017 and 2018 where comparatively lower incidence in 2017. In 2018 highest incidence of acute urinary retention was observed during second inter monsoon (2 nd IM) period which is comparatively lower incidence than in 2017.In 2019 highest incidence of AUR observed in first and second inter monsoon periods and with an overall reduction of incidence of AUR. There is a significant association of AUR with average relative humidity only in 2017. (P< 0.011) **Conclusion**: The incidence of acute urinary retention during south-west monsoon and second inter monsoon periods were high compared to north-east monsoon and first inter monsoon periods during 2017 to 2019.There is a significant association of incidence of acute urinary retention in 2017 with average relative humidity.

KEYWORDS: Acute urinary retention, seasonal variation, Sri Lanka.

INTRODUCTION

It is well known that the seasons of the year and the climatic factors such as temperature and humidity exert an influence on some disease conditions, such as coronary heart diseases, cerebrovascular diseases, and respiratory diseases.[2-4] However, in the current literature, fewer evidences are found worldwide and no studies have been carried out in Sri Lanka for the evaluation of the association between seasonal variations in climatic factors and the incidence of acute urinary retention.[5] Therefore, the aim of the present study is to determine whether there is a correlation between climatic factors and incidence of acute urinary retention in a population in central Sri Lanka. It is generally assume that lower urinary tract symptoms (LUTS) in patients with benign prostatic hyperplasia (BPH) can be affected by seasonal variations, becoming exacerbated in the cold season.

Acute urinary retention (AUR) is a sudden and painful inability to void urine despite having a full bladder.[1] Most of the patients present with acute suprapubic pain and an inability to micturate. This may be associated with factors predisposing in acute urinary retention such as a urinary tract infection, changes of medications or delaying voiding. Apart from this, neurological causes including peripheral neuropathy, iatrogenic nerve damage during pelvic surgery, upper motor neurone disease (such as Multiple Sclerosis, Parkinson's disease), or bladder sphincter dysinergy can exert an influence on AUR. Most of the patients present with painful palpable distended bladder with supra pubic tenderness .Presence of fever, rigors or lethargy may suggest an infective cause. It is generally assumed that lower urinary tract symptoms (LUTS) in patients with benign prostatic hyperplasia (BPH) can be affected by seasonal variations, becoming exacerbated in the cold season.[5] This phenomenon can be explained whereas, cold stress increases sympathetic activity, which stimulates smooth muscle contraction in the bladder, and induces detrusor over activity, which decreases the

voiding interval and volume.[6,7] This exacerbation may precipitate AUR.

METHODOLOGY

The records of patients admitted to Teaching Hospital, Peradeniya, Sri Lanka from January 2017 to December 2019 for acute urinary retention were retrospectively reviewed. 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 average temperature (measured in degree Celsius), average relative humidity (recorded in percentage) and average 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 analyzed using Statistical Package for the Social Sciences (SPSS) version 20.

RESULTS AND DISCUSSION

The study covered first consultations of inward patients at Teaching hospital, Peradeniya. A total of 600 patients were enrolled in our study during a period of 36 months. Of the study group, 81.67% (490/600) of patients were male and 18.33% (110/600) were female who ranged from 1 to 96 years. There was a significant difference between female and male patients ($p < 0.001$). The average age of all patients was 64.29 years. The median age of male patients was 68 years while the median age of female patients was 67.5 years.

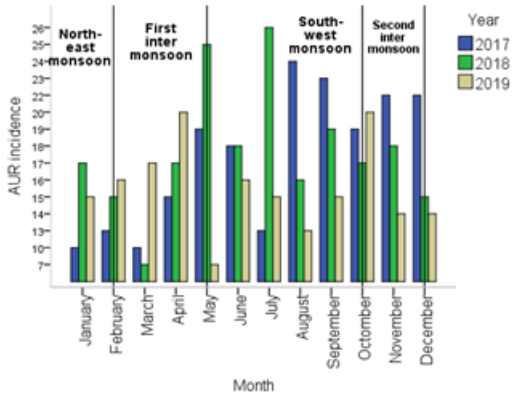

Figure 1 : Incidence of acute urinary retention in 2017 - 2019

According to figure 1, the highest incidence of acute urinary retention was recorded during south west monsoon in 2018.During the same monsoon period highest incidence of AUR was observed in 2017 as well, but comparatively lower incidence than in 2018.In 2019 highest incidence of AUR was detected in first and second inter monsoon periods with a lower incidence compared to 2017 and 2018.During 2017 to 2019, higher incidence of AUR observed in south-west monsoon and second inter monsoon periods.

The comparative analysis of the incidence of acute urinary retention reveals that there is a significant association with average relative humidity only in 2017. (Table 1, P< 0.011) None of the other parameters show any correlation with incidence of acute urinary retention.

According to tests of normality Kolmogorov-Smirnov and Shapiro-Wilk, only average rainfall and average air temperature have normal distribution, hence the median relative humidity in 2017, 2018 and 2019 are 82.92, 83.42 and 82.45 respectively. The median relative temperature in 2017 is comparatively lower than that of in 2018.

Table 1. : Correlation of variables with acute urinary retention.

Year	Acute urinary retention	Average relative humidity	Average rainfall	Average temperature
2017	Pearson correlation	.704*	-.002	.300
	Significance (2 tailed)	.011	.995	.344
2018	Pearson correlation	.298	.282	-.020
	Significance (2 tailed)	.347	.374	.950
2019	Pearson correlation	.070	.539	.020
	Significance (2 tailed)	.828	.070	.952

Correlation is significant at the 0.05 level (2-tailed).*

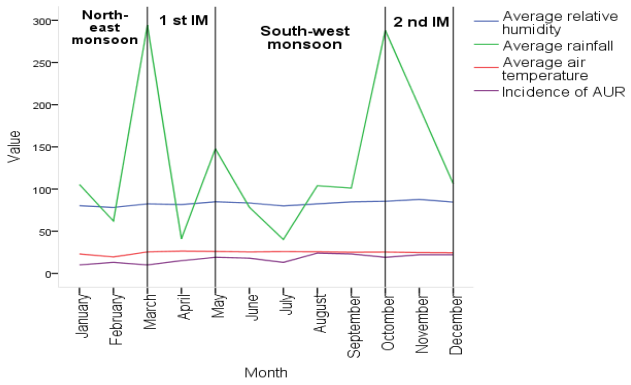

Figure 2 : Incidence of AUR with average relative humidity , average rainfall and average air temperature in 2017

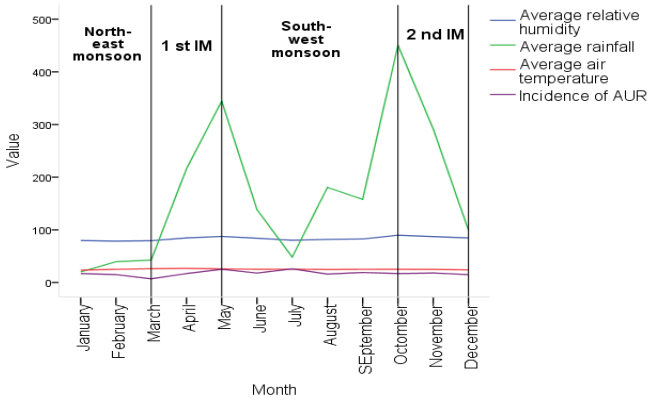

Figure 3 : Incidence of AUR with average relative humidity, average rainfall and average air temperature in 2018

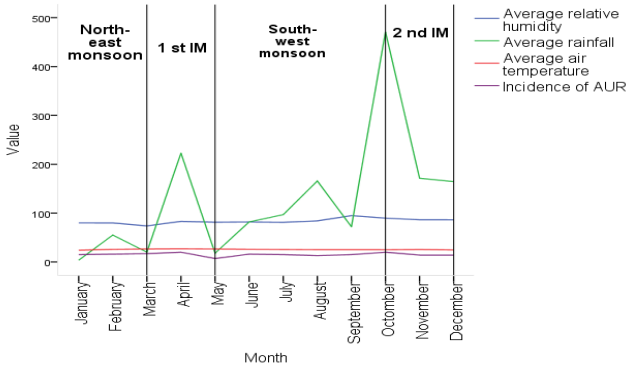

Figure 4 : Incidence of AUR with average relative humidity , average rainfall and average air temperature in 2019

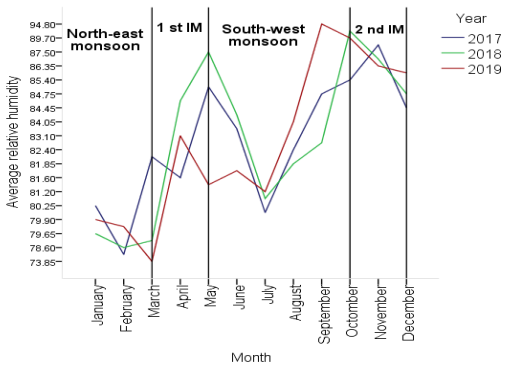

Figure 5 : Average relative humidity during 2017 - 2019

In a study carried out in South Korea among patients above 40 years, they have found a higher incidence of acute urinary retention during winter and October which was also observed in our study as well.[8] Furthermore a study carried out in Thaiwan concluded that significant monthly variation in the incidence of AUR occurred during the year and January (midwinter) had the highest rates.[1]

It is seen that the effects of climatic changes on acute urinary retention 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 acute urinary retention and average relative humidity.

CONCLUSION

The incidence of acute urinary retention during south-west monsoon and second inter monsoon periods were high compared to north-east monsoon and first inter monsoon periods during 2017 to 2019.There is a significant association of incidence of acute urinary retention in 2017 with average relative humidity.

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