East Kent Hospitals University NHS
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DOES A HEAT WAVE IN THE UNITED KINGDOM REPRESENT A SIGNIFICANT HEALTH RISK IN TERMS OF AKI?

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INTRODUCTION

The Meteorological offices definition of a heat wave is "when the daily maximum temperature of more than five consecutive days exceeds the average maximum temperature by 5 °C, the normal period being 1961-1990"[1]. In August 2003 there was a heat wave in the UK which lasted ten days, this was associated with an increase in mortality during that period, 2000 deaths were attributed to the heat[2]. NHS England states that the major risk during a heat wave is dehydration and overheating, especially for those with pre-existing co-morbidity, predominately in the elderly[3].

AIM

The aim of this study was to examine the relationship between the incidence of AKI and climatic temperature changes.

Hypothesis: During period of very hot weather in the UK the incidence of AKI would increase.

METHOD

This Study was conducted in one of the most southern counties in the UK, which is historically is warmer than the others. Data on the weather was taken from a Local weather web site* from 01-01-2012 – 31-12-2015. Serum creatinine request data was then extracted from the regional pathology data base.

Patterns of testing were examined and compared to those when the temperature was ≥25 °c and during a period defined using the met office definition of a heat wave. Simple correlations between number of tests, numbers of AKI and temperature were performed.

Finally, data from the local AKI database was matched to temperature data. The data was weighted to correct for number of serum creatinine tests per day. Logistic regression analysis was run to examine the independent effect of temperature on the odds of having an AKI during hot weather.

RESULTS

There were 9 episodes defined as a 'heat wave' during the study period. There were 157 days where the Maximum temperature was ≥25°c.

Figure 1. Mean number tests by weekday

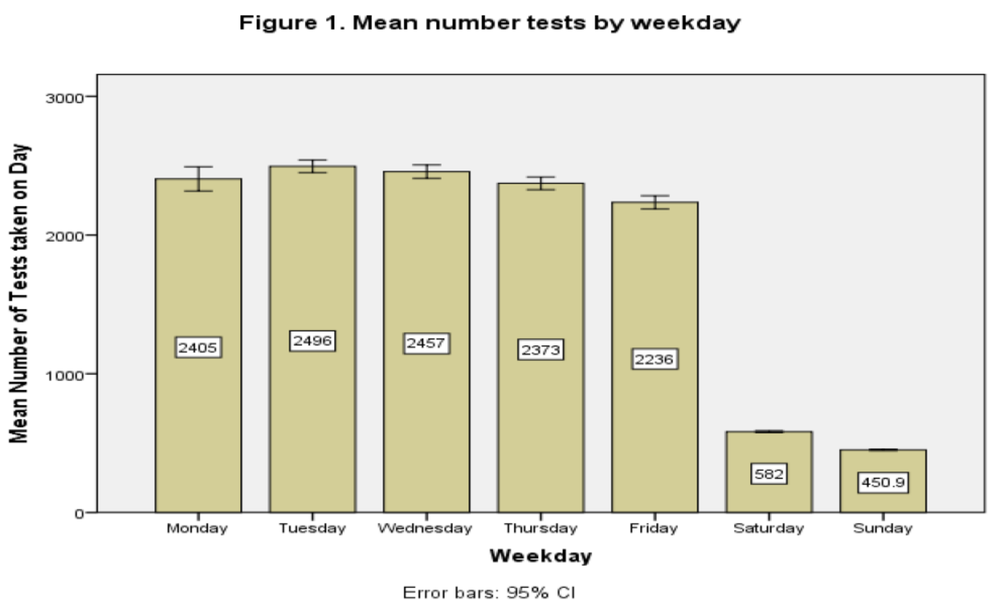


Figure 3. Correlation AKI and maximun daily temperature

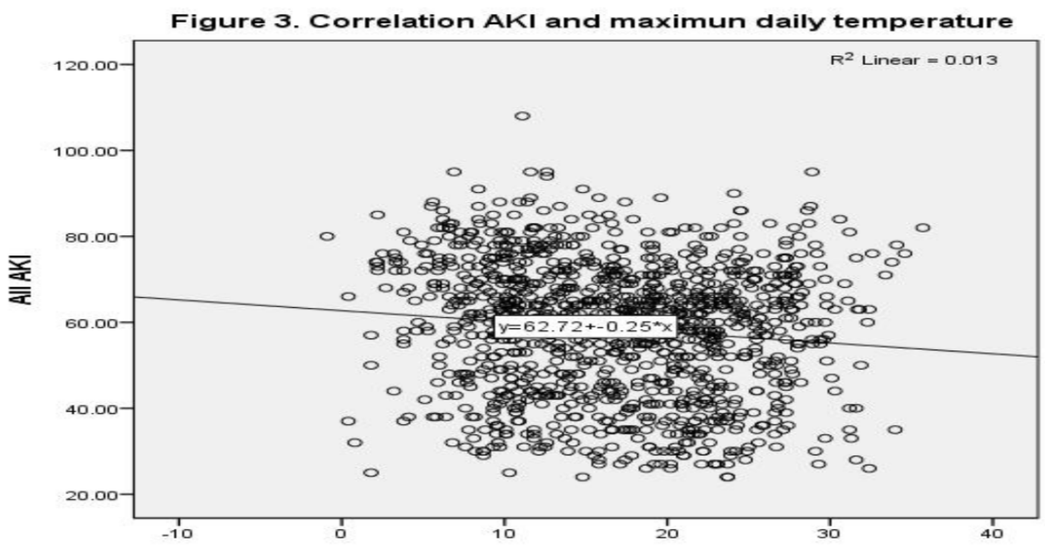
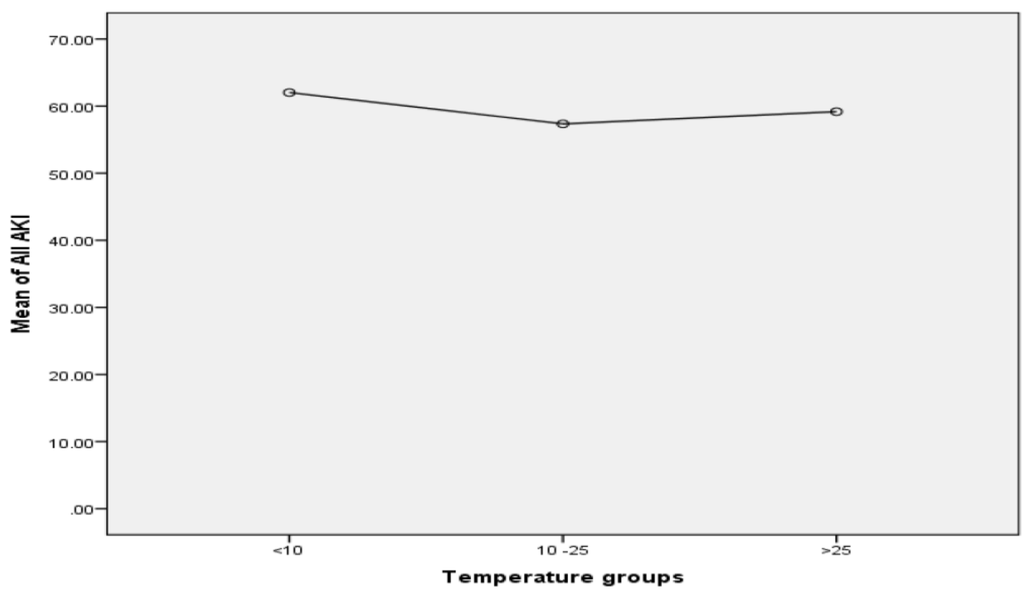


Figure 2 .Comparison of mean AKI by temperature group



The multivariable analysis was unable to demonstrate an association with incidence and stage of AKI having corrected for baseline GFR and Charlson co-morbidity score

Figure 4 multivariable analysis

	Beta coef.	Sig	Lower CI	Upper CI
Maximum Temp	0.001	0	0	0.001
Gender	0.029	0	0.029	0.03
Age	0.01	0	0.01	0.01
Stage CKD	0.086	0	0.086	0.086
Charlson groups	0.11	0	0.109	0.11
Constant	-0.213	0	-0.214	-0.212

CONCLUSION

- This study could not demonstrate a correlation between increased serum creatinine testing and heat-waves or warmer climate temperatures in the UK.
- It does shows a small significant relationship between increased testing and increased incidence of AKI, more apparent in colder climatic temperatures.
- This study shows that there is no increased risk of AKI during summer heat-waves in England.

The inclusion of AKI advice relating specifically to hot weather in AKI patient guidelines may be unnecessary and distract from advice given relating to more significant risks of AKI.

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*Canterbury Weather. http://www.canterburyweather.co.uk/compare

KKRG Kent Kidney Research Group

CHSS University of Kent Centre for Health Services Studies

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