

Short Report

Seasonal trends in the occurrence of eclampsia

J. NEELA, L. RAMAN

ABSTRACT

Background. The occurrence of eclampsia may be related to season and altitude.

Methods. We studied the influence of environmental factors such as range of temperature and relative humidity on the occurrence of eclampsia by collecting data on consecutive cases of eclampsia admitted to the Government Maternity Hospital, Hyderabad, from September 1987 to August 1988. The mean range of temperature and relative humidity were calculated for each month. The data on eclampsia and adverse outcome in terms of still-births were analysed in relation to variations in temperature and humidity.

Results. The results support the speculated relationship between increasing humidity and a lower temperature range and the increased incidence of eclampsia. Still-births due to eclampsia also showed a positive correlation with relative humidity.

Conclusion. A better understanding of the relationship of weather to eclampsia may provide further insight into the poorly understood pathophysiology of the disease.

Natl Med J India 1993;6:17-18

INTRODUCTION

Eclampsia, like many other diseases, is influenced by the social milieu of diet, class and medical care as well as by the season and weather.^{1,2} Diet and weather, in particular, have been described to be either causal or at least accessory factors in its occurrence.¹

We investigated the relationship between the atmospheric temperature and humidity and the occurrence of eclampsia.

PATIENTS AND METHODS

Data was collected from consecutive cases of eclampsia admitted to the Government Maternity Hospital, Hyderabad, between September 1987 and August 1988. The maximum and minimum temperatures and percentage humidity were recorded daily for 12 months. Based on the daily recording, the mean and standard deviation were calculated for each month. Data on eclampsia and adverse outcome in terms of

still-births were analysed in relation to the variations in temperature and humidity for each month and also for the total period. The relationship between primiparity and total deliveries, eclampsia and still-births, was also calculated.

RESULTS

Seasonal variation

Figure 1 shows the temperature range and relative humidity in relation to the occurrence of eclampsia and still-births due to eclamptic and non-eclamptic causes for each month.

It was observed that with increasing humidity and lower temperature ranges, the incidence of eclampsia showed an increase with a parallel trend in the occurrence of still-births due to eclampsia. The number of still-births was lower between January and April when the relative humidity was low and temperature range was high.

The occurrence of still-births due to eclamptic and non-eclamptic causes in relation to various seasons did not reveal any trend ($\chi^2=0.43$). A high degree of correlation ($p<0.001$) was seen between relative humidity on the one hand and the temperature range, eclampsia and still-births in eclampsia on the other. Temperature range with still-births in eclampsia and eclampsia were also inversely related (Table I).

Figure 2 shows the effect of parity on total deliveries, eclampsia and still-births in different months. Primipara constituted roughly one-third of the total deliveries ranging from 25% to 32% with no significant increase in any particular month or season.

Primipara however accounted for 50% and 72% of the

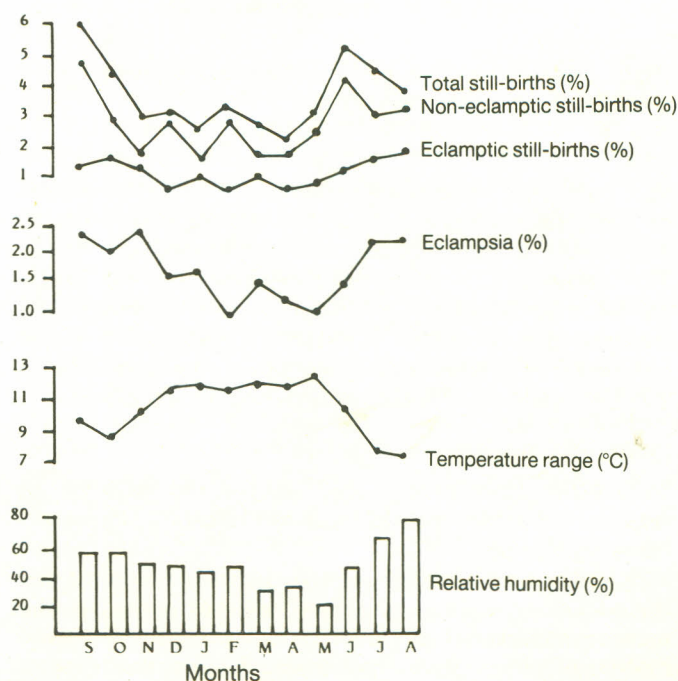


FIG 1. Month-wise variation in relative humidity, temperature range, eclampsia and still-births

National Institute of Nutrition, Indian Council of Medical Research, Jamai Osmania P.O., Hyderabad 500007, Andhra Pradesh, India

J. NEELA, L. RAMAN

Correspondence to J. NEELA

© The National Medical Journal of India 1993

TABLE I. Correlation matrix depicting the inter-relationship of still-births with relative humidity, temperature range, eclampsia and still-births in eclampsia

	Temperature range	Eclampsia	Total still-births	Still-births in eclampsia
Relative humidity (%)	0.9156*	0.7436**	0.5365***	0.7376**
Temperature range (°C)		-0.7695**	-0.5859***	-0.8961*
Eclampsia			0.4679	0.8103*
Total still-births				0.5393***

*p<0.001 **p<0.01 ***p<0.05

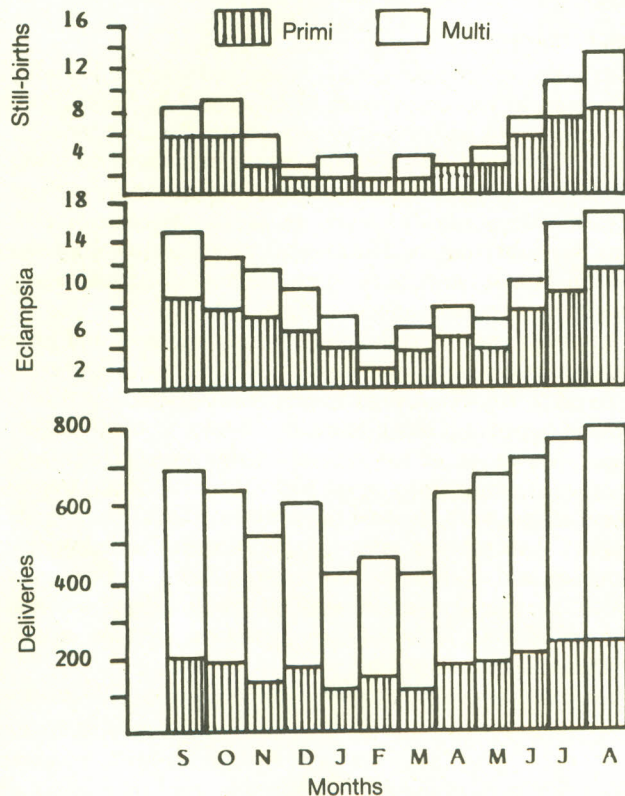


FIG 2. Seasonal variation in the incidence of eclampsia and still-births in relation to parity

total number of patients with eclampsia. During the months of June, July, August and September, the occurrence of eclampsia was high in primigravidae ranging from 56% to 73% followed by a progressive decrease with the lowest incidence in February. A similar trend was observed in multigravidae. Eclamptic still-births constituted a major proportion of primiparous deliveries ranging from 50% to 100% with 60% to 75% occurring during the wet months.

DISCUSSION

Very little information is available on the influence of seasonal and environmental factors in relation to the occurrence of eclampsia.³

In earlier studies, the relationship between eclampsia and the prevailing weather or season was not related to the number of deliveries and other variables. Davies¹ observed that while some authors had reported a low incidence of eclampsia in the spring and autumn, others reported a higher incidence during the summer months. Timonen did not find any correlation with season.⁴ Excessive heat and humidity,

warm and cold winds, mild weather and sudden changes in the weather have all been described to influence the occurrence of eclampsia. However, these studies have been unsystematic and without the clear-cut design required to confirm these observations.

Other reports have suggested that there is a higher incidence of pregnancy induced hypertension and eclampsia during winter.⁵ Since these months are humid, it was speculated that the alterations in humidity may have resulted in vasospasm, thereby increasing the incidence of eclampsia.⁵

Our study seems to support the speculation that higher humidity is possibly related to a higher incidence of eclampsia. The city of Hyderabad is humid during the rainy season, with dry summers and winters and, coincidentally, the incidence of eclampsia was higher during the rains than in winter or summer.

It has been also reported^{5,6} that in the tropics, the incidence of eclampsia is higher during cool humid weather and lower when it is dry. Others have suggested⁷ that the tendency for convulsions is reduced by the dehydration that occurs in the dry season. This is further supported by the observation that maternal serum osmolarity is lower in women who are susceptible to convulsions. Such a possibility seems to be supported by our study.

Analysis of data with respect to deaths due to eclamptic or non-eclamptic causes did not indicate any seasonal variation though there was a trend for higher still-births in eclampsia during rainy months.

Our results suggest that there is a relationship between weather and eclampsia. A better understanding of this relationship may provide insight into the pathophysiology of this serious disease.

ACKNOWLEDGEMENTS

We thank Dr Vinodini Reddy, Director, National Institute of Nutrition, for her encouragement. We are also grateful to Mr Balakrishna for his help in analysing the data, Mrs Suvarna for data collection and Mrs Sudha Srinivasan for typing the manuscript.

REFERENCES

- Davies AM. Epidemiology of pregnancy toxaeias. *Israel J Med Sci* 1971;7:6.
- Griswold DM, Cavanagh D. Eclampsia and the weather. *Am J Obstet Gynecol* 1965;91:847-51.
- Hypertensive disorders of pregnancy—Report of a WHO study group. *WHO Tech Rep Ser* 1987;758:28.
- Timonen S, Lokki O, Wichmann K, Vara P. Seasonal changes in obstetrical phenomena. *Acta Obstet Gynecol Scand* 1966;44:507-33.
- Raman L, Kumar S, Venkatesh PR. Pattern of pre-eclampsia and eclampsia in Bangalore hospitals in India. *Proceedings of the second congress of hypertensive disorders in pregnancy*. Cairo: Ain Shams Univ Press, 1982:19.
- Raymond N. Metereological relations of eclampsia in Lagos, Nigeria. *Br J Obstet Gynecol* 1981;88:706.
- Agobe JT, Good W, Hancock KW. Metereological relations of eclampsia in Lagos, Nigeria. *Br J Obstet Gynecol* 1981;88:706-10.