Hospitalisation in children with adrenal insufficiency: is there a differential burden between boys and girls between age groups?

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Background

Adrenal insufficiency (AI) is a rare disorder in childhood. It can be divided into primary adrenal insufficiency (PAI), which is due to adrenal gland dysfunction, and secondary adrenal insufficiency (SAI) due to problems involving the pituitary gland or hypothalamus. Irrespective of the underlying cause of AI, all patients are at risk of an adrenal crisis (AC), which has an estimated incidence of approximately 5-10 AC/100 patient years in treated AI (1) and there is some evidence to suggest that these events are increasing (2). Apart from some X linked disorders, the incidence of the underlying disease processes that cause AI is largely comparable between the sexes. However, some aspects of the morbidity may differ, such as androgenisation in girls with congenital adrenal hyperplasia and this may be associated with differences in treatment and AC risk. Despite the health burden imposed by AI, there is a paucity of information on the utilisation of hospital services by children and adolescents with AI and hypopituitarism.

Aim

The aim of this study was to determine the frequency of episodes of hospitalisation in children with adrenal insufficiency (AI) and hypopituitarism in Australia, and to analyse patterns in these admissions.

Method

Australia has a population of approximately 6 million in the age group 20 years and under. Information on all hospital admissions is coded according to ICD 10 classification (3) and is stored according to the principal diagnosis by the Australian Institute of Health and Welfare (AIHW). These data for each year are available in data cubes and include the following variables: principal diagnosis, age group (years) (<1, 1-4, 5-9, 10-14, 15-19) and sex. The Australian population for each year was obtained from the Australian Bureau of Statistics (4). Crude rates were calculated overall and for the age and sex specific groups. Poisson regression models were used to assess the significance of the observed differences and to determine Incidence Rate Ratios (IRR).

Results

There were 3786 admissions for treatment of AI and hypopituitarism in patients aged 0-19 years during the study period (48.8 admissions/million/year). Hypopituitarism comprised 40.1%,(n=1520) a further 22.2% (n=841) of the admissions were for congenital adrenal hyperplasia (CAH), there were 470 (12.4%) admissions for a principal diagnosis of an AC, and 632 (16.7%) admissions for “other and unspecified AI” . The incidence of ACs increased significantly over the study period (IRR for each successive year of 1.06 (95% CI 1.02, 1.11)). Overall, admission for AI was comparable between the sexes. Children aged 0 to 4 years comprised 40.1% of the admissions. Admission rates for AI, hypopituitarism, CAH and “Other and unspecified causes” of AI were highest among infants and decreased with age. Admissions for PAI increased significantly with age (p<0.001). Males had higher rates of admission for hypopituitarism (p<0.01) but females had higher rates of admission for CAH and “other and unspecified causes” of AI (p<0.01). The age group 15-19 years had the largest number of admissions for a principal diagnosis of AC (n=143, 30.4%). Age was found to be significantly associated with AC admission (p<0.01) but the sex of the patient was not associated with admission for an AC (p=0.11)

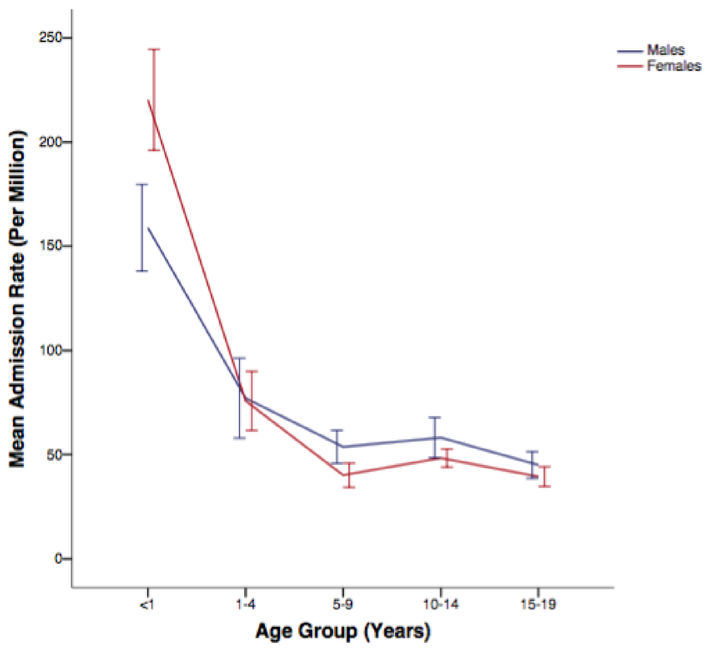

Figure 1: Total Admissions for all AI by Sex and Age Group, Australia, 2000/1-2013/14 (95% CI)

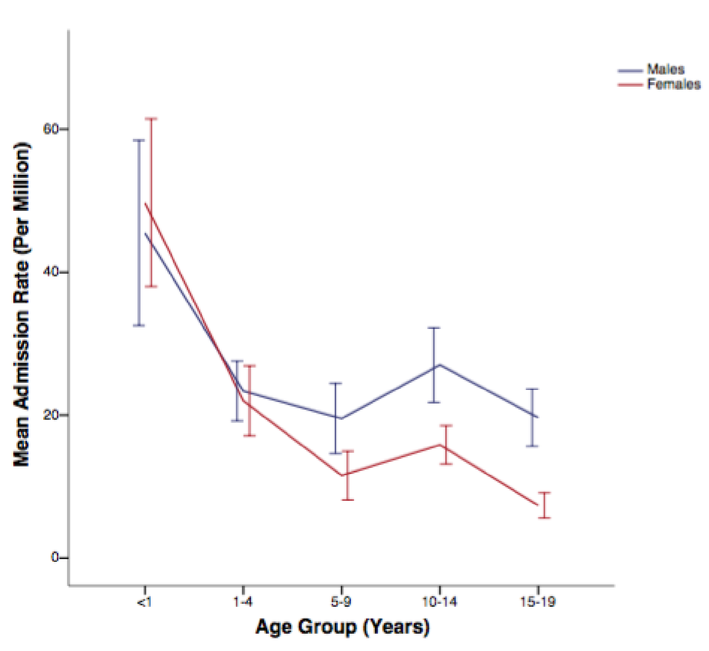

Figure 2: Total Admissions for all Hypopituitarism by Sex and Age Group, Australia, 2000/1-2013/14 (95% CI)

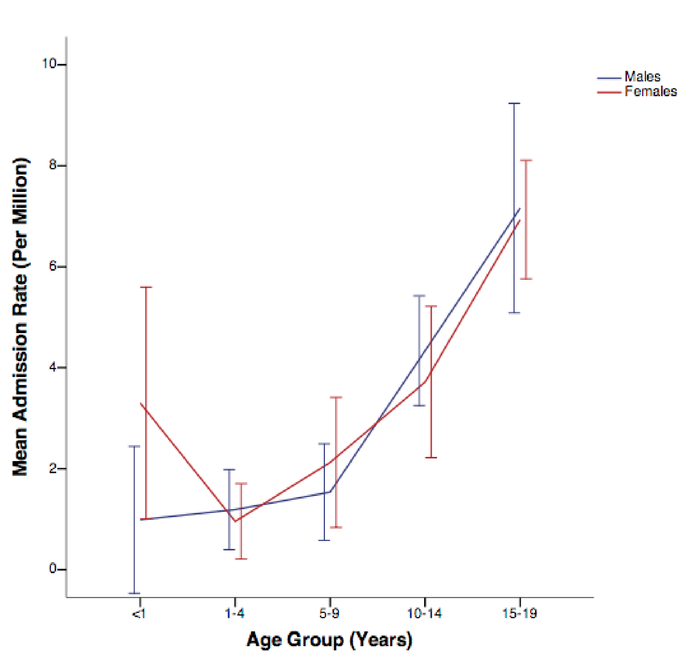

Figure 3: Total Admissions for Primary Adrenal Insufficiency by Sex and Age Group, Australia, 2000/1-2013/14 (95% CI)

Conclusion

Admissions among children for the combined causes of AI decreased with age, males had higher rates of admission for hypopituitarism and females had higher rates of admission for CAH and “other and unspecified causes” of AI. Adrenal crises increased over the study.

References

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Adrenal

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