

# Management of Intercurrent Illness in Adrenal Insufficiency

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## Background

Primary and secondary adrenal insufficiency (PAI and SAI) confer increased mortality<sup>1, 2</sup>. Adrenal crisis significantly contributes to the increased mortality found amongst hypoadrenal patients<sup>1</sup>. However, adrenal crisis is largely preventable with appropriate hydrocortisone replacement therapy.

Several recent publications have advocated that patients with primary and secondary adrenal insufficiency (PAI and SAI) be given emergency injectable hydrocortisone to reduce the risk of adrenal crisis<sup>3,4,5,6</sup>.

Given the limited evidence-base for this recommendation, we do not routinely issue injectable hydrocortisone to our patients.

## Aims

To assess:

- Demographics and clinical characteristics of patients with adrenal insufficiency presenting to hospital.
- Frequency of presentations.
- Patients' knowledge of crisis-preventing behaviours ('sick day rules').
- Prevalence and views about emergency injectable hydrocortisone kits.
- Influence of knowledge of crisis-preventing behaviours and use of emergency kits on presentation rates/clinical features on presentation.
- Whether there are differences in these features between patients with PAI and SAI.

## Methods

From a database of patients on hydrocortisone, 81 patients with diagnosis of Addison's disease, and an age-matched group of 66 patients with non-functioning pituitary adenoma or craniopharyngioma were selected. Details of all acute presentations to hospital over the last 6 years (June 2006-June 2012) extracted from patient records.

Telephone questionnaire tested patients' knowledge of 'sick day rules.' Free answers were matched to the most similar option.

	PAI	SAI	p
Hypotensive	13 / 58 (22.4%)	5 / 36 (13.9%)	0.31
Hyponatraemic	18 / 50 (36.0%)	7 / 25 (28.0%)	0.61
Hyperkalaemic	8 / 52 (15.4%)	0 / 24 (0%)	0.05
Metabolic acidosis	6 / 18 (33.3%)	2 / 11 (18.2%)	0.67
Hypoglycaemia	8 / 52 (15.4%)	0 / 25 (0%)	0.048

Table: Blood pressure and biochemistry, at presentation, in patients with primary (PAI) and secondary (SAI) adrenal insufficiency

## References:

- Bergthorsdotti R et al. *J Clin Endocrinol Metab* 2006; 91: 4849-4853.
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- White K, Arlt W. *Eur J Endocrinol* 2010; 162: 115-120.
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## Results

- 54.3% of PAI patients and 34.8% of SAI patients had at least one admission over the six year period.
- Frequency of presentations was higher in the group with PAI than SAI (p=0.007). There was no correlation between age and presentation rate.
- The most common cause of presentations in the PAI group was GI infection whilst in the SAI group respiratory infections predominated.
- 48.5% of PAI and 67.3% SAI presentations had an infective cause.
- Trends suggested that PAI patients were more likely to have the listed key clinical features of adrenal crisis (Table). However, the only statistically significant result was that PAI patients were more likely to be hypoglycaemic on presentation (p=0.048).
- Figure 1 show patients' responses to 2 different scenarios which assessed their knowledge of the 'sick-day rules.' Each possible answer was assigned a score based on level of appropriateness. During febrile illness (a), most patients knew that they should increase their steroids. During vomiting illness (b), few patients said that they would attend A&E. There was a trend towards higher 'sick-day rules knowledge' scores in patients with PAI vs. SAI (9.2 vs. 8.4, p=0.053)
- There was a trend towards higher 'sick-day rules knowledge' scores in patients with PAI vs. SAI (9.2 vs. 8.4, p=0.053).
- 61% of PAI and only 28% SAI patients said they had been educated about sick day rules at their last clinic visit.
- 46% of PAI but only 7% of SAI patients possessed emergency kits.
- The frequency of admissions amongst those patients who have emergency injection kits was not significantly different from those without (p=0.53).

## Conclusions

- Patients are not as well equipped to avoid adrenal crisis during intercurrent illness as they might be.
- Improved education strategies may be required.

## Further research

- Are patients who use emergency kits less unwell on presentation than those who do not?
- Comparative study with other centres.

