An unusual complication of Graves disease

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INTRODUCTION

- We report the case of a girl treated for tachycardia and hypertension associated with hyperthyroidism who developed symptomatic 2:1 heart block.

CASE REPORT

- A 10-year old girl presented with a history of nausea, sore throat, pyrexia and chest pain 2 days after starting daily atenolol 32mg (1mg/kg/day) and carbimazole 40mg.
- On examination, she appeared thyrotoxic, with inflamed tonsils and mild abdominal discomfort. A baseline bradycardia with sudden symptomatic episodes of self-limiting bradycardia (lowest monitored reading of 28 beats per minute) and hypotension (57/43mmHg) was noted.
- The 12-lead electrocardiogram (ECG) identified 2:1 atrioventricular (AV) block with prolongation of the P-R interval (317 milliseconds) (Figure 1). Biochemistry confirmed that the patient remained hyperthyroid (free T4: 42.4pmol/l, free T3: 8.9pmol/l, TSH <0.01mlU/l) with white cell count: 13.7, neutrophils: 8.2 and C-Reactive Protein: 43. Echocardiogram showed no evidence of structural heart disease.
- The patient was admitted for cardiac monitoring; atenolol was discontinued, carbimazole was reduced to 10mg twice daily and a ten-day course of oral phenoxymethylpenicillin for suspected tonsillitis was commenced. She was discharged after 48hrs once the heart rate had stabilised.
- Repeat ECG prior to discharge (figure 2) revealed resolution of 2:1 atrioventricular block, however first degree heart block persisted with P-R prolongation to 240 milliseconds.
- Four months after presentation, and following an increase in carbimazole dose to 40mg daily, there is improvement in thyroid function (free T4: 14.3pmol/l, free T3: 9pmol/l, TSH<0.01) and Graves disease has been confirmed.
- Repeat electrocardiogram showed a normal heart rate and a P-R interval of 185 milliseconds (Figure 3). Hypertension is still present and she remains under endocrine follow up.

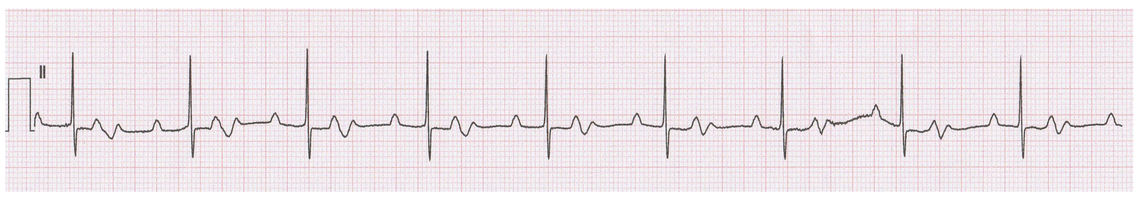

Figure 1. ECG at presentation

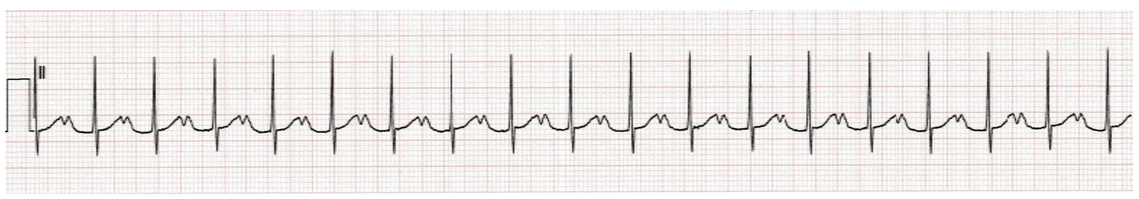

Figure 2: ECG 48hrs after admission

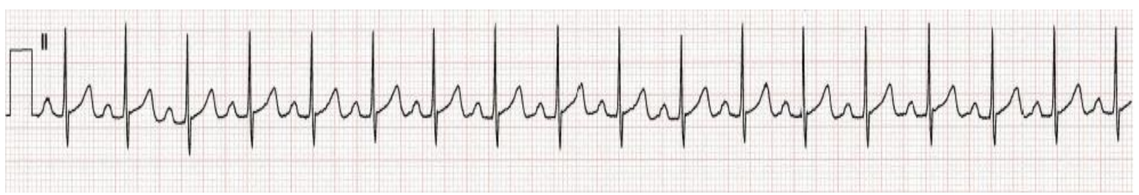

Figure 3: ECG 4months after initial presentation

REVIEW OF LITERATURE

- Atrioventricular conduction defects are rare but significant complications of hyperthyroidism.[1]
- Rates in adult patients vary from three to thirty per cent[1], however, this effect is not well reported in paediatrics.
- Beta-blockers and co-existent infection further increase the risk of such conduction abnormalities.[2,3]

CONCLUSIONS

- We have reported a case of type 2 atrioventricular block in a patient with an upper respiratory tract infection, who presented shortly after starting atenolol for Grave's disease.
- The conduction defects returned to normal after four months of carbimazole therapy and improvement in her thyroid status.
- In view of this well-described association, we recommend a baseline 12-lead ECG prior to initiating beta-blocker therapy to identify conduction abnormalities in children with hyperthyroidism.

References:
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