The effectiveness of propranolol in our patients may be related to the elevated plasma renin activity, although the degree of plasma renin elevation before treatment did not correlate with the fall in BP. Studies in hypertensive adults have shown that propranolol may be effective even when the renin is not elevated (Holland and Kaplan, 1976). Further data will be needed to determine if plasma renin activity will predict the antihypertensive effect of propranolol in children. The plasma concentration of propranolol varies markedly in adults given the same oral dose (Nies and Shand, 1975), and this probably explains the wide range of dosage found to be effective in this study.

Our arbitrary goal in treating hypertension in children is a diastolic BP of 85–90 mmHg or less. Several patients in this study received additional medications after the propranolol trial period. Using propranolol combined with other agents, a diastolic BP of 85 mmHg or less was achieved in most of the patients.

Theoretically it might be ideal to achieve a normal BP for age in hypertensive children, in whom one must be concerned about a 40–60 year follow-up, but there is no proof that this is essential, while the number of drugs and their side effects multiply when such an attempt is made. Patients who are asked to endure such side effects may stop complying with the treatment. There is also the important and poorly answered question about growth rates in children on large doses of antihypertensive drugs. In view of these considerations we do try to achieve a BP normal for age, but only when it can be done with well tolerated doses of antihypertensive drugs.

We conclude that propranolol is a safe and effective antihypertensive agent in children, which has been effective when other drugs—including α -methyl dopa, hydralazine, and diuretics—have been ineffective. Because it blocks β -adrenergic receptors, it is contraindicated in patients with asthma and congestive heart failure. It should not be used in patients with pheochromocytoma unless an α -adrenergic blocking agent is given simultaneously (Pritchard and Ross, 1966).

Summary

The antihypertensive effect of oral propranolol was studied in 9 children with hypertension. After treatment with propranolol, systolic blood pressure fell by an average of 26 mmHg ($P < 0.01$). Diastolic pressure decreased by 20 mmHg on average ($P < 0.01$). The mean propranolol dose was 2.5 mg/kg per day. Side effects included bradycardia and anorexia. There was no correlation between

pretreatment plasma renin activity and fall in blood pressure. Propranolol is an effective and well tolerated antihypertensive agent in children.

This work was supported in part by Clinical Investigation Projects Grant number 5–16–445. The opinions expressed are those of the authors and are not to be construed as reflecting the views of the US Navy.

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Heights and weights of West Indian children with the sickle cell trait

The sickle cell trait (genotype AS) appears to offer young children some protection from falciparum malaria and, with few exceptions, appears to be benign. A recent report that children in Philadelphia with the sickle cell trait were smaller in size and

poorer in mental development than control (genotype AA) children (McCormack *et al.*, 1975) must, therefore, be viewed with concern. The selection in this series of the 19 AS children from twin pairs and possible differences in socioeconomic and other factors between the controls and those with the trait may, however, have been responsible for the differences.

A longitudinal study in a Jamaican community on 200 children with normal haemoglobin and 21 children with the sickle cell trait reached different conclusions from that of the Philadelphia investigation (Ashcroft *et al.*, 1976). Socioeconomic state, school attendance, and family background did not differ significantly between the two groups and each child had been brought up in a small uniform community. Mean heights and weights did not differ significantly at 2 years of age or at 10 years, and classroom behaviour, sociability, and educational achievement were also no different when assessed at 10 years of age.

Additional studies in Dominica and Jamaica have now enabled more extensive comparisons of the size of West Indian children with AA and AS haemoglobin.

Methods

An anthropometric and haematological survey was undertaken in 1975 in two schools on the island of Dominica in the eastern Caribbean. 750 pupils (aged 5–12 years) at Goodwill Primary School in Roseau, the capital, and a random sample of 250 in the same age range at the primary school in Portsmouth, the next largest town on the island, participated. Another survey was undertaken in four schools (Jack's River, Albion, Camberwell, and Long Road) in rural areas in the parish of St Mary, Jamaica, in 1976.

Heights and weights were measured by standard techniques, with children wearing clothes but not shoes. Venous blood was taken for routine haematological investigations which included electrophoresis on cellulose acetate (pH 8.4) and on agar gel (pH 6.2). Comparisons were limited to AA and AS children and other genotypes have been excluded from the results.

Results

The Figure shows the heights and weights of 66 boys and 50 girls in Dominica aged 6–10 years with the AS genotype compared with those of 344 boys and 318 girls with the AA genotype. No consistent differences in mean heights or weights at yearly age intervals were found, although AS boys

Figure Mean heights and weights of Dominican schoolchildren with AA and AS genotypes.

at 6 and AS girls at 7 years of age were significantly shorter ($P < 0.05$). There were very few children aged 5, 11, or 12 and they have therefore not been included in the results.

In Jamaican schools the number of children was smaller and therefore a different method of comparison was used. There were 24 boys and 30 girls aged 6–12 years with the AS genotype compared with 266 boys and 279 girls with the AA genotype. Means and standard deviations (SD) of heights and weights of both sexes with normal haemoglobin were calculated for yearly age intervals, and estimates for individual months were derived from straight lines connecting these points. The height and weight of each child with the sickle cell trait was then expressed as a 'standard score', being the number of standard deviations by which the measurement differed from the mean of the AA subjects of the same sex and age. Mean scores for height and weight of boys and girls with the trait were slightly greater than those of children with normal haemoglobin. Children with the sickle cell trait were on

average 0.5–1.0 cm taller and 0.5–1.0 kg heavier than the others. However, these differences were not significant (*t* test) at different ages or when all ages were combined (Table).

Table *Standard scores of height and weight of Jamaican children aged 6–12 years with AA and AS haemoglobin*

Genotype	n	Height score		Weight score	
		Mean	SD	Mean	SD
Boys					
AA*	266	0.00	1.00	0.00	1.00
AS	24	0.11	0.91	0.10	1.00
Girls					
AA*	279	0.00	1.00	0.00	1.00
AS	30	0.10	0.95	0.30	1.35

*Mean and SD are 0.00 and 1.00 by definition (see text).

Discussion

The results of the present studies agree with earlier observations in Jamaican children (Ashcroft *et al.*, 1976) and in Jamaican adults (Ashcroft *et al.*, 1969) that no significant differences exist between heights and weights of AS and AA subjects. The only long-term population study to compare the health of AS and AA subjects is one from Jamaica (Ashcroft and Desai, 1976). Mortality and morbidity were similar in 119 AS adults and 856 AA adults followed up for 12 years. The evidence therefore suggests that, with the exception of rare vascular occlusive episodes which may occur in severe anoxia, the AS genotype is benign and is not associated with abnormalities of growth.

Summary

No consistent differences were found in mean heights and weights of 170 schoolchildren aged 6–12 years with the sickle cell trait and 1247 schoolchildren with normal haemoglobin living in Dominica and Jamaica.

We thank the staff of various institutions in Jamaica and Dominica who made this investigation possible.

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Weaning very low birthweight infants from mechanical ventilation using intermittent mandatory ventilation and theophylline

The prognosis for very low birthweight infants with severe hyaline membrane disease (HMD) requiring mechanical ventilation has improved in recent years (Robertson and Tizard, 1975), partly because of improved ventilation technique (Kirby *et al.*, 1972; Reynolds, 1974). The duration of mechanical ventilation may still be protracted, particularly in very low birthweight infants. The ventilator dependence of some of these infants seems to be owing to inadequate ventilatory effort and therefore treatment with xanthines, which have been used effectively in neonatal apnoea (Shannon *et al.*, 1975), might facilitate their weaning from mechanical ventilation.

This report describes two very low birthweight infants with severe HMD who were weaned from mechanical ventilation using both continuous-flow intermittent mandatory ventilation (IMV) (Kirby *et al.*, 1972) and oral theophylline.